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Athens Journal of Social Sciences

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President
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- **Dr. Domenico Maddaloni,** Head, Sociology Research Unit, ATINER & Associate Professor, University of Salerno, Italy.
- **Dr. Philip G. Cerny**, Director, Social Sciences Division, ATINER & Professor Emeritus, University of Manchester (UK) and Rutgers University (USA).
- **Dr. George S. Tsagaris,** Associate Professor, Cleveland State University, USA.
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Learning from Fun Leadership Experiences

By Hannele Laaksonen[*] & Satu Hietala[±]

The low appeal of nursing is currently a challenge in Finland and many other countries. Retaining factors that would keep nurses within the field have been discussed, as have attracting factors that would draw new workers to the field. Finnish discourse often focuses on the heaviness of nursing, shift work, bad leadership and low work wellbeing. The last can be influenced by many things, such as the use of humor. Workplaces can learn to use positive humor, which raises spirits and increases a sense of community. The purpose of this study was to survey fun workplace experiences in the social and health care field and what was learned from them. As there has been little research on the use of humor in social and health care work in Finland, the aim of this study is to increase knowledge and discussion of the topic. The study was conducted in 2016-2017 by collecting narratives (N=34) from master's degree students in Leadership. The data were analyzed through inductive content analysis. Fun experiences in personnel leadership showed and reinforced social capital and a sense of community at the workplace. The sense of community included developing workplace community skills, maintaining a sense of togetherness, advancing workplace well-being and doing activities, spending time and using professional skills together. Learning from fun experiences through reflection was formed from leadership that increases workplace well-being. This consisted of four categories: reinforcing a fun work atmosphere, reinforcing togetherness, appreciative leadership and the multiplicity of the supervisor's role. Positive humor can be used to advance workplace well-being and personnel retention.

Keywords: *leadership, humor, work well-being, experience-based learning, Finland*

Introduction

The nurse shortage of the Finnish social and health care field has become a major challenge that has not yet been overcome. Nursing is seen as hard and underpaid work, an opinion that has only become more common as nursing has become more burdensome because of the COVID-19 pandemic. The social and health care field must increase not only its attractiveness, but also its ability to retain nurses.

Workplace humor, joy and fun have also been studied by Goswami et al. (2016). According to their study, supervisors' use of positive humor increased their subordinates' positive feelings at work and increased their commitment to work. Supervisors' use of transformational leadership style strengthened the connection between their positive humor and their subordinates' positive feelings. Hughes and Avey (2009) have also shown a connection between transformational leadership

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and subordinates' commitment to their organization, trust-building and work satisfaction. Supervisors who use transformational leadership are assumed to use more humor than other supervisors.

Satisfied employees achieve good results, which leads to the success of the organization. Central features of successful workplace communities are openness, trust, bravery, honesty, active communication and a positive atmosphere. In healthy workplace communities, the members are able to influence things and topics are discussed regularly, openly and honestly, which increases members' sense of belonging to the community (Laaksonen 2008, p. 128). These factors increase worker retention.

Positive humor can be used at the workplace to lighten even heavy days, to aid the expression of feelings, make handling difficult things easier and to repair and build relationships. Workplace atmosphere depends on interpersonal relationships and the chemistry between people. By improving workplace atmosphere, it is possible to create a dynamic community that enables individuals' creativity and innovativeness. It is also possible to meet co-workers during leisure time, breaking official hierarchies and thus creating new connections (Khalili 2016, Fluegge-Woolf 2014). Green et al. (2014) found that supervisors can even affect the quality of care by improving workplace atmosphere.

This article discusses fun situations related to personnel leadership in the social and health care field and learning from them. The respondents were professionals in the field who were studying leadership and would graduate to work as supervisors.

Literature Review

The Use of Humor at Work

Humor is famously a difficult skill that requires social awareness and emotional intelligence, as fun and humor mean different things to different people (Plester et al. 2015). The benefits of humor in increasing general well-being have been well-known for a long time, and workplace humor in particular has been connected to better performance, work satisfaction and a sense of togetherness. Humor has also been found to have a positive effect on health, managing work-related stress, easing exhaustion and worker retention (Mesmer-Magnus et al. 2012, Goswami et al. 2015). Humor also serves functions such as building and maintaining collegiality and good relationships (Holmes 2006, p. 26). Humor can also be seen as a leadership tool that can be used to reach positive results for the organization (Wijewardena et al. 2010).

Moake and Robert (2021) have studied the effects of men and women's use of humor from the perspective of social latitude, gender and formal organizational status. Their results show that using humor is riskier for women than men, especially if they are in low positions. The use of aggressive humor by women in low positions led to more negative perceptions compared to the use of aggressive humor by women in high positions. There was no such difference in reactions to men's use of humor based on their positions. The use of humor by women in higher positions was accepted when it was positive, benevolent and accepting (affiliative). Their results suggest that women in lower positions have less latitude in their use of humor than women in higher positions (Moake and Robert 2021).

Neves and Karagonlar (2020) have focused on the influence of supervisors' style of humor on their subordinates' performance. They suggest that supervisors should be trained to use beneficial styles of humor such as affiliative and self-enhancing styles. They also emphasize that detrimental styles should not be tolerated at all. Peng et al. (2020) have studied the effect of supervisors' use of humor on their subordinates' creativity. According to their results, organizations should consider their supervisors' use of humor in the long term, so that they can create a relaxed and harmonious atmosphere, which improves creativity.

Often certain colleagues understand each other's humor better than others because of their similar senses of humor (Mesmer-Magnus et al. 2012). This is entirely natural, as people are different and form connections easier with certain people. We can also identify people who laugh and are generally more amused than others (Mesmer-Magnus et al. 2012). Such people's company is often actively pursued, as their laughter and positivity can be infectious. They are good at seeing the good and amusing side in events, which makes them eager to express their positive emotions. There are also people at workplaces who produce moments of humor and laughter by communicating in an amusing way (Mesmer-Magnus et al. 2012). These employees have the ability to present things in a humorous fashion and they enjoy making others laugh. They can also lighten difficult situations through humor, which helps everyone in managing their stress and handling difficult topics.

Fun situations at the workplace offer individual staff members refreshing breaks, which have positive effects and increase commitment to the organization and work goals (Plester and Hutchinson 2014). Humor can also be used to positively influence team productivity, personnel development and group processes such as efficient information sharing, goal formation and emotion management (Romeron and Pescosolido 2008). A clear connection has been found between humor and innovation. Employees whose supervisors used humor more often saw themselves as more innovative than did employees who saw creativity and innovation as requirements at their work (Pudt 2015).

Employee humor has been shown to have a positive effect on health, coping with work-related stress and work efficiency (Mesmer-Magnus et al. 2012). Humor between employees from two different organizations was studied by Charman (2013), who found that humor was a central factor in the work relationship between police officers and ambulance staff. Humor was used to manage the demands of work and to strengthen group values and the common bonds between the two groups. Humor can be used to serve many functions at work, one of which is advancing a sense of collegiality. One of the most important uses of humor is building and maintaining good relations with coworkers (Holmes 2006, p. 26, Mesmer-Magnus et al. 2012, Cooper 2008).

A positive, genuine sense of fun can be a sign of a healthy organization (Georganta and Montgomery 2019), which can be used to create more productive and harmonious workplaces (Plester et al. 2015). A fun work environment increases employee commitment and productivity (Fluegge-Woolf 2014), increases camaraderie and aids in reaching a flow state (Plester and Hutchison 2014). A sense of fun may also increase feelings of belonging, acceptance and togetherness and improve teamwork and efficiency (Georganta and Montgomery 2019).

In summary, the use of positive humor at the workplace level creates and maintains relationships, strengthens group values, increases efficiency and improves employee commitment to the workplace community and its goals. On an individual level, humor releases tension, increases innovation, refreshes and helps manage the demands of work by improving health. Humor can also be used to interpret events, handle difficult matters and express emotions. The use of humor increases positive emotions. It is clear that successful, positive humor has many useful effects on both the individual and workplace level, which is why all employees can be encouraged to use it.

Experiential Learning

The use of humor can be learned through the everyday experiences of each supervisor and subordinate. The theory of experiential learning dates to the 1930s. John Dewey (1859-1952) was one of the first to use the concept of learning by doing. He was a US pedagogist and one of the central developers and representatives of Pragmatism (Kolb 1984). The model of experiential learning was later developed by David Kolb. In his model, learning works through reflecting on concrete actions and experiences, which results in the theoretical understanding of phenomena and improved operating models. This process of learning emphasizes experiences, impressions and self-reflection (Kolb 1984).

Workplace learning can be formal learning, such as attending training, or everyday learning through various work situations (Nikolova et al. 2014). Hagar and Halliday (2009) define unofficial, everyday learning as goalless learning that happens in various situations and offers individuals both inner and outer benefits. Everyday learning is not tied to a time or place and can happen alone or in groups. According to Nikolova et al. (2014), everyday learning happens through reflection, experimentation and by learning from coworkers and supervisors. Workplace learning also improves organizational performance (Kleefstra et al. 2020).

Methodology

Materials and Methods

The purpose of this study is to survey the fun workplace experiences of master's degree students in social and health care leadership that are related to personnel leadership. The study questions are:

1. What are fun experiences in personnel leadership like?
2. What could be learned from fun experiences in personnel leadership?

There has been little research on the use of humor in the workplace in the social and health care field in Finland. The aim of this study is to increase knowledge and discussion of the use of humor in the field and to give development proposals on how to create fun situations and how to use humor at workplaces.

Target Group

The data were collected in 2016-2017 from master's degree students in social and health care leadership (N=47), who had at least three years of experience in the field. One third had a degree in social work and two thirds in health sciences (e.g., registered nurses, public health nurses, midwives, paramedics, physiotherapists, bioanalysts, radiographers). Approximately one third worked as supervisors.

Data

The study was presented to students orally during class and later textually on the electronic Moodle platform. The students submitted their responses electronically to a folder on Moodle, which could only be opened by the teacher. The students were asked to write a narrative according to the following instructions:

- Share one personal anecdote about a situation related to personnel leadership that you found fun. What did you learn from the experience?

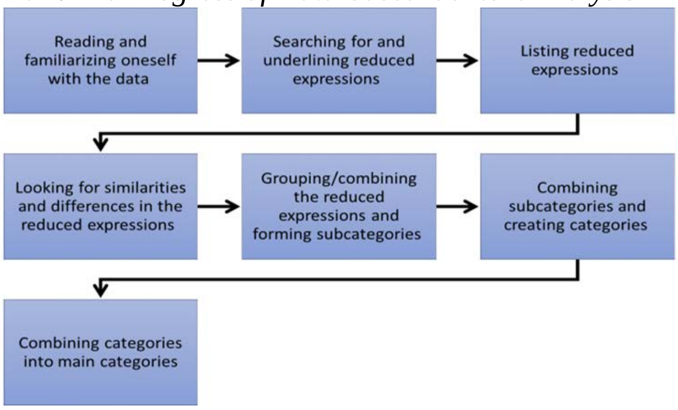
The following additional guidelines were given:

- Write a narrative that contains a beginning (circumstances, actors, environment) middle (the event itself) and an end (how the situation was resolved or resolved itself). You can change the names of participants and narrate the event as a story. You do not have to share your own role. The event must, however, be something that genuinely happened and was witnessed by you, whether as a subordinate, supervisor, bystander or participant.

Data Analysis

The data were analyzed through inductive content analysis. The purpose of the analysis was to produce new information on what the respondents understand as humor and how humor is used in units of the social and health care field. The data were read through several times to obtain a full picture of their contents. The data were then reduced, grouped and abstracted (Figure 1) (Hiesh and Shannon 2005). Through analysis the phenomenon under study was described in a reduced and abstracted fashion that suited the study's aims and research scheme.

Figure 1. *The Progress of Data-based Content Analysis*



Source: Tuomi and Sarajärvi 2009.

One hundred seventy-three (173) original expressions relevant to the study questions were picked from the data. The data were then reduced by coding the chosen original expressions in a way that preserved their meaning. There were 196 reduced expressions, which were compared to discover expressions with similar contents. These were then grouped under subcategories, which were then given names that covered all the expressions placed under them. This resulted in 31 subcategories. The same process was then used to create eight categories from the subcategories, which were then used to create two main categories. The synthesis created through reduction, grouping and abstraction answers the study's aims and research scheme (Hiesh and Shannon 2005). Table 1 gives an example of the creation of subcategories.

Table 1. *An Example of the Creation of Subcategories*

The head nurse wanted to change practices and to get the staff to participate in discussions. They wanted to create a more loose and open atmosphere. (18)	Supervisor daring to act different	
The project manager played the role of a blood sausage with lingonberry jam. Everyone laughed after the unveiling. (33)	Supervisor daring to take on a different role	Supervisor's open-mindedness
The workplace has a good atmosphere between staff and the supervisor enables their own participation in lightening the mood with their behavior (12)	Supervisor's behavior lightening the mood	

Ethical Background and Reliability of the Study

The topic of the study is important to leadership and personnel well-being, and is thus significant even from the perspective of wider society. The study was conducted using good research ethical practices by following general honesty, accuracy and carefulness in all phases of the study. An attempt has been made to present the results of the study as openly as possible (Vilkka 2015, pp. 41–53). Permission for conducting the study was sought from the Tampere University of Applied Sciences, with whom an agreement was made on the use of the research data. The original data are owned by the Tampere University of Applied Sciences. The participants were informed both orally and textually of the purpose and aims of the study and of its confidentiality and voluntariness. The data were copied electronically and protected by password to ensure no outsiders had access to them. After the study was finished, the copied data were destroyed.

The goal of scientific research is to produce new information of the studied phenomenon that is as reliable as possible. In assessing reliability, the goal is to assess the truthfulness of the information produced by the study. The criteria of reliability in qualitative research are credibility, confirmability, reflexivity and transferability. Credibility has been reinforced by reading the data several times to understand the perspective of those who participated in the study. Confirmability has been strengthened by describing the progress of the analysis as accurately as possible, so the reader may follow its logic and reliability. Reflexivity means ensuring the researcher is aware of their own starting points as the conductor of the study. After analysis, the researchers noted that similar results have been reached in earlier studies, which increases the study's reliability. To help assess transferability, this article describes the study's participants (Tuomi and Sarajärvi 2009).

Results

Fun Experiences in Personnel Leadership

The fun experiences written by social and health care field professionals were formed, through inductive content analysis, from the following four categories: *Togetherness, Openness and bravery, Appreciating and rewarding skills and Equality.* They formed the main category of *Strengthening community and social capital* (Table 2).

Table 2. *Fun Experiences in Personnel Leadership*

Subcategory	Category	Main category
Working together Spending time together Solving problems together Advancing work well-being	Togetherness	
Supervisor laughing at their own mistakes Supervisor's open-mindedness Supervisors' innovativeness	Openness and bravery	Strengthening community and social capital
Verbal rewards Monetary rewards Well-being benefits offered by employer	Appreciating and rewarding skills	
Experiencing equality Supervisor's participation as an equal Low levels of hierarchy	Equality	

Togetherness appeared in the responses as *doing* together. Most often the activities were related to something done outside of work, such as the work community's visits to a summer cabin, staff days, farewell parties, Christmas parties or training events.

> "The yearly cabin trip. Everyone from the owner to the staff comes. We go through the year's return and events. Everyone gets to ask and comment. Then we develop something we'd agreed beforehand. We exercise and eat and drink well."

Togetherness was formed by spending time together freely outside of work and by talking about topics other than work. Using professional skills together was also seen as a fun experience in personnel leadership, as were situations involving skills and development. Developing work and training for new assignments involved joy and laughter. They also became annual traditions.

> "Being together freely brings out new sides from people and learning to know them in different situations gives more perspective. Often fun experiences like these increase the sense of togetherness and improve cooperation."

Maintaining team spirit increased the sense of togetherness. For instance, experiences of the workplace community staying together even under challenging situations or the entire personnel, supervisors included, having experiences together strengthened team spirit. Some workplaces had so called "our things" that increased a sense of togetherness. Staff days, on which the employer arranges some fun event for the personnel, were seen as increasing a sense of togetherness. Most respondents mentioned staff days as doing so while also being fun experiences.

> "You know those 'our things'? … Every team has them or at least should have. Even better, it's great when the supervisor is part of it!"

One of the things forming openness and bravery was the supervisors' ability to laugh at their own mistakes. This does not mean self-mockery, but the ability to acknowledge one's own mistakes. An openminded supervisor can even succeed in activating the personnel to contribute more by breaking old ways of doing.

> "To me it's always a fun experience when people, subordinates or supervisors, admit to, share, laugh at and learn from their own mistakes."

Supervisor's innovativeness was seen as a fun personnel leadership experience. Through their innovativeness the supervisor can, e.g., create a good atmosphere at the start of the day.

> "The head nurse made coffee for everyone for the morning meeting and had often baked something. While drinking coffee we went through the day's work and finally the supervisor took out a book and read the day's poem."

Appreciating and rewarding skills included verbal rewards, which was thanks and recognition for a job well done. Other ways of appreciation included monetary rewards and well-being benefits offered by the employer. Rewards and appreciation were seen as part of personnel leadership.

> "One fun experience I could mention is the last Christmas party arranged by our previous employer."

> "The company management decided to reward the employees with an extra bonus that was paid right before Christmas. The bonus was paid as a certain percentage of your income and the number was larger for those who received a lower wage."

One of the things forming equality was experiencing equality with the supervisor in a situation where they participated in creating a fun atmosphere. Seeing the supervisor participating as one of the employees was seen as a fun experience.

> "I came to the conclusion that fun personnel leadership at my workplace is having fun at work, and having supervisors as part of the fun. Our people don't stop talking when a supervisor walks past. They join in on the talk and fun."

Low levels of hierarchy were seen as fun experiences. One such example was a situation where hierarchies were discarded and work roles forgotten.

> "The managing nurse was responsible for organizing the Christmas party and one of their tasks was planning and directing the Christmas play, where the roles were played by employees. While working on the play, a momentary humorous relationship developed between the supervisor and the subordinates. While making the play the hierarchy disappeared and they forgot their work roles."

Learning from Fun Experiences in Personnel Leadership

The social and health care professionals' categories of learning from fun experiences in personnel leadership were *Reinforcing a fun work atmosphere, Reinforcing togetherness, Appreciative leadership* and *The multiplicity of the supervisor's role*. They formed the main category of *Leadership that increases workplace well-being* (Table 3).

Reinforcing a fun work atmosphere could be seen in the supervisor's genuineness, relaxedness, and in their willingness to laugh at themself, to show their funny side and to trust in the power of humor. Spontaneity could be seen in the supervisor's innovativeness, relaxedness, flexibility and in their ability to act without needless restraint and to "go all in".

Table 3. *Learning from Fun Experiences in Personnel Leadership*

Subcategory	Category	Main category
Genuineness Spontaneity Trust Creating a fun work environment	Reinforcing a fun work atmosphere	
Acceptance Connection with others Supporting togetherness Inclusion	Reinforcing togetherness	Leadership that increases workplace well-being
Appreciation Rewarding Presence Listening	Appreciative leadership	
Pointing the way Role model Being an example	The multiplicity of the supervisor's role	

> "To be able to smile at the experiences of others, I must be able to laugh at myself [the supervisor says]. Fun and amusing experiences help us when we must make less nice decisions."

> "This workplace experience also taught me that the supervisor taking the stage and moving away from their safe work role supports their subordinates moving outside their comfort zone. The supervisor had created something fun for the audience, not made a mockery of themself."

Trust was the supervisor allowing humor and fun in everyday work. Joy and laughter were allowed, as were mistakes. The supervisor themself inspired trust. Reinforcing a fun work atmosphere meant creating a relaxed atmosphere, seeing the fun even in small things and using humor as a source of power, while also considering the limits of humor.

> "This supervisor taught me that personnel can be led 'through joy'. Of course they participated in us nurses' reports to find out more about our tenants' conditions, but at the same time they created a good mood among us nurses."

Reinforcing togetherness included acceptance, which meant listening to subordinates, having a positive attitude, allowing fun, supporting subordinates and cheering them. Connecting with others consisted of keeping subordinates informed, intervening in problems, reinforcing team spirit and by meeting subordinates in more relaxed situations.

> "It's good for the personnel to see a more relaxed supervisor, who turns out to be a normal person. It's also good for the whole workplace to do fun stuff together and see that their work is appreciated."

A sense of togetherness could be improved through common fun experiences, by spending time with coworkers without working and by organizing fun events.

Inclusion meant listening to employees on developing the workplace and encouraging subordinates to develop and innovate their jobs. It could also include organizing common events.

> "The supervisors showed an ability put themselves out there and be innovative. Their idea of a relaxed afternoon together succeeded perfectly. Sometimes it's good to 'check your brain at the door' and meet tour coworkers in a looser setting. Staff days at their finest!"

Appreciative leadership meant perceiving the supervisor as an equal with their subordinates. Equality between units was also emphasized, while excessive camaraderie was frowned upon. Rewarding a well-done job was seen as important, whether it was material or verbal. Positive feedback was also seen as important.

> "Another important lesson was that even if it's just one workplace in a large organization, all workplaces should have an equal position. Forepeople have an important role in maintaining this."

The supervisor's presence was seen as important. They had to be approachable and willing to participate in their subordinates' joys and sorrows. Listening included considering others, expressing interest in the personnel and listening to subordinates.

> "It's good for the supervisor to show themself so they don't remain distant to their subordinates. I want to be a supervisor who's approachable and aware of everyday routines, not someone who hides behind their desk and monitor."

> "Stable situations are rare at work. Situations change and you can't expect things to stay the same. The head nurse must be present in their subordinates' workplace joys and sorrows."

The multiplicity of the supervisor's role included the supervisor being the one to point the way in e.g., the use of humor. They were also a role model in that not everything needed to be known perfectly. The subordinate had to set natural boundaries to their action and follow them. The supervisor was also a role model in leading with joy.

> "Through their own relaxed and humorous attitude, the supervisor can have an effect on the entire workplace and its atmosphere."

> "The supervisor points the way and gives their subordinates a chance to be more free. Sometimes you work hard on a tight schedule, but sometimes lightness is required to maintain team spirit and morale. Recharging mental batteries pays itself back many times over. The team is more productive and innovative."

The supervisor was an example on how to act in various situations in e.g., the use of humor. They could also demolish prejudices through their actions.

> "Humor is an important source of strength... which is heavily implied by the supervisor's model and guidelines. There needs to be room for humor, but it can't be allowed to drown out actual work."

> "The supervisor can through their own example break prejudices related to gender."

Discussion

Assessment of Results

The fun personnel leadership narratives of social and health care professionals discussed and emphasized the importance of strengthening social capital and a sense of community. Togetherness included doing things, spending time and using professional skills together, developing workplace community skills, strengthening team spirit and advancing workplace well-being. Mesmer-Magnus et al. (2012) have also found that supervisors' and subordinates' use of humor can advance work groups' sense of togetherness. According to Holmes' (2006) study, humor has many functions at the workplace, one of which is advancing collegiality. One of humor's most important functions was building and maintaining good relationships with coworkers. Such collegiality is often built and maintained through humor. A workplace where people experience pleasant feelings, and which has a good atmosphere helps people recover. Positive emotional sates are caused by shared success, achievements, receiving and giving support, kindness and good group humor (Aro et al. 2018).

Openness and bravery were shown in the responses as the supervisor's ability to laugh at their own mistakes, open-mindedness and innovativeness. Trust is created through open communication. According to Georganta and Montgomery (2019), a fun workplace atmosphere also involves genuineness, spontaneity and trust. Trust can be considered a part of the workplace's social capital, which enables a work organization that is creative and develops effectively (Klausser 2012, Baker et al. 2016). Commitment and genuineness are good starting points for credible and exemplary leadership. Leading bravely with a natural and personal style is more important than individual characteristics (Husman 2015, p. 19).

The responses of the social and health care professionals saw appreciative leadership as appreciation and rewarding. Being present and listening were also included in appreciative leadership in the responses. The appreciation of skills was seen in the responses as verbal and monetary rewards as well benefits offered by the employer. A benefit could be e.g., an evening paid for by the employer. Equality was seen in the responses as the experience of equality, the supervisor participating as an equal and low levels of hierarchy. Dickson-Swift et al. (2014) also found that people want to feel useful and important and to be treated as individuals. One of the supervisor's basic jobs is to make their subordinates experience these feelings. It is a leader's job to create an environment, in which everyone can use their abilities fully. This can be achieved by leading with openness and transparency (Dickson-Swift et al. 2014).

According to Kolb (1984), learning proceeds from the reflection of concrete experiences and actions towards theoretical understanding and new procedures. In the narratives of fun personnel leadership in social and health care, learning through reflection consisted of leadership that increases workplace well-being. In turn, it consisted of four categories: reinforcing a fun work atmosphere, reinforcing togetherness, appreciative leadership and the multiplicity of the supervisor's role. Reinforcing a fun work atmosphere included genuineness, trust, spontaneity, and creating a fun work atmosphere. The fun experiences also taught about the multiplicity of the supervisor's role. It included pointing the way and acting as a role model and an example. Humor has an effect on general well-being and health, helps manage work-related stress, lessens fatigue and improves worker retention (Mesmer-Magnus et al. 2012). A fun work atmosphere involves genuineness, spontaneity and trust (Georganta and Montgomery 2019).

According to the social and health care professionals' responses, reinforcing togetherness could be learned from one's own experience of personnel leadership, acceptance, connection to others, reinforcing togetherness and inclusion. The sense of togetherness was often built through unofficial events. Humor can be used to advance collegiality and to build and maintain good relationships with coworkers (Holmes 2006, p. 26, Mesmer-Magnus et al. 2012). Humor can also be used to form connections with others (Fegai 2011) and to increase an experience of connection with others (Georganta and Montgomery 2019). Positive workplace humor has been shown to have a connection with worker retention (Mesmer-Magnus et al. 2012).

The results of this study were quite similar to those of earlier studies on the use of humor in the workplace, even though not all earlier studies were made in the context of the social and health care field. Humor and leadership appear quite similar globally and regardless of context, even though the concept of fun is still somewhat unclear. The social and health care professionals saw humor as something that increases togetherness, trust-inspiring leadership, appreciation for skills and equality. All of these reinforce a sense of community and social capital.

Conclusions

The following conclusions are presented:

- There is a role for positive humor in the workplace and in leadership. Positive humor is seen to influence many positive factors that affect work well-being and work retention. The supervisor's genuineness and relaxedness are positives in many senses and do not diminish their credibility. Workplaces that allow humor often have an atmosphere of open communication and permissiveness, which further increases trust. Positive humor and the supervisor's openness rather increased their appreciation among their subordinates than diminished it.
- The social and health care professionals' responses emphasized how the fun experiences of personnel leadership and learning from them happened

outside regular working hours, at relaxed events organized by the employer such as staff days. This suggests that workplace communities need activities organized by the employer outside of regular working hours.

- Supervisors could use humor even as a potential leadership tool to help achieve positive results for the organization. Improving work well-being increases work retention. One factor improving well-being could be a workplace environment that allows and uses humor.

Further research could focus on supervisors' views on the importance of positive humor. Another topic could be the views of supervisors and subordinates on how a workplace environment that supports the use of positive humor is created.

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The Relevance of Scientific Dissemination during the Vaccine Campaign: The Italian Virologist Communication on Social Media

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The scientist role has progressively gained an essential relevance during the 2020 pandemic. In fact, the virologists' exposition turned out to be fundamental for the public opinion, both for the well-informed and people unaware about health, transmission, infection and, today, vaccination programs. This paper aims to first set an explorative investigation about the social communication practices during the first three months of the vaccine campaign addressed on social media by Italy's most established virologists. The arising digital scenario and the resultant pervasive presence in our daily life of web platforms, such as social media, has revolutionized the nexus between science and society. More scholars argued about the disintermediated current shape of science communication that directly connects scientists and the larger public, driving the sociological debate towards the analysis of the current processes of sense-making construction. On this assumption, we aim to answer the research question about how Italian scientists communicate and approach the larger public on social media. Therefore, the empirical part of this paper consists of a data collection phase conducted on Facebook and Twitter. The collected data have been analyzed by a content analysis oriented to identify the contradictory or uniformity of disintermediated communication features of the observed social media profiles in order to push and follow, during the ongoing vaccine dosing program, a proactive reflection about the key role of scientific dissemination of information.

Keywords: *communication of science, scientists' visibility, social media communication, content analysis, topic modelling*

The Communication of Science Inside and Outside the Digital Environment

The relationship between science and society has become increasingly relevant nowadays. Following Ancarani (1996), science has been gradually faced with a variety of politically-relevant social and economic issues such as health, food, transport, communication, energy, innovation and so on. Meanwhile, the public space got transformed focusing citizens as, "the depositary of the structures and processes of democracy as the power control, the delegation of people's will, public discussion and public opinion" (Mazzoleni, 2004, p. 17).

Ty, therefore, institutions representing science and the researchers themselves cannot neglect communication in their daily work (Scamuzzi and Tipaldo, 2015). In particular, science's public communication has an essential role in defining the relationship between researchers and citizens (Bucchi and Trench, 2014) and now,

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a scientist is socially appreciated if he manages to reduce the distance between these subjects. In this perspective,

> "the need for a close relationship between science and society, between experts and the public, arises in a process of involvement that allows us to grasp the urgent needs of humanity" (Pellegrini, 2018, p. 33).

Beyond the different levels of analysis of communicative phenomena and consistent models that have outlined the relationship between science, scientists and the various types of audience (Jasanoff, 1997), scientific communication studies agree that the mediator role is

> "a central variable for the regulation of the processes of constructing meaning, able to orient exchanges between the issuer and the recipient towards outcomes not at all obvious, even with equal content of messages" (Scamuzzi and Tipaldo, 2015, p. 68).

In light of this assumption, the Internet represents the mediatic environment that has succeeded in revolutionizing the communication of science simultaneously to its evolution. Firstly, intended as a canonical medium deputed to the information storage (*read-write web)*, the web changed over the last 20 years, transforming itself in an integrated participative environment (*people-centric web* and *participative web*) (Patel, 2013).

There are many web-based activities that scientists carry out daily, as for example document transmission, magazine editing, data sharing, article creation, publishing of conference proceedings and informal exchanges also via videoconferences. In this way, Pellegrini and Saracino in fact argue about "Science 2.0" as an

> "increasingly widespread practice among scientists of publishing online experimental results, emerging theories, claims of discoveries and drafts of articles that anyone can read and comment on" (Pellegrini and Saracino, 2019, p. 76).

Furthermore, Science 2.0 cannot disregard communication through the social media sphere, by which it is possible to create networks of collaboration (i.e. *Researchgate* is designed to allow relationships between researchers related to any type of discipline), to spread news and rebut scientific controversies. Today, science and society work together because they allow citizens to take a stand on scientific issues, which used to be "an exclusive prerogative of the scientific community and political decision-makers" (Bucchi, 2010, p. 141).

Before Internet affirmation, the mainstream media such as radio and TV were the only promoters of communication of science to citizens, although,

> "by their nature they point out the evident asymmetry between the scientific community and the general public and the clear directionality of science communication" (Scamuzzi and Tipaldo, 2015, p. 150).

In the past, traditional media acted as an intermediary between universities and the public sphere, for example through press releases, while with the advent of digital information shifted in an open-access vocation, accessible to anyone who is interested. In this way online media offers scientists more communication opportunities in dealing directly with the public, rather than relying on journalists as mediators (Peters et al., 2014).

The web, furthermore, connotes as an environment where a greater participation about scientific knowledge is possible, and at the same time, can reveal traps related to scientific controversies or misinformation in the way that

> "the web breaks that sequential order and the tightness of a series of 'filters' that previously distinguished the path of scientific results of the researcher to the general public" (Bucchi, 2006, p. 72).

Although it has finite limits, "the web can allow a faster and immediate access to scientific information (possibility to access original papers, databases, contacts of researchers)" (Scamuzzi and Tipaldo, 2015, p. 150), and in addition social networks become useful tools to simplify the communication of science and its results, as well the understanding of how research has been led.

Following Bucchi and Saracino (2021), it is relevant to point out how the science communication concept for scientific arguing has been recently rethought also due to the increasing public demand about science and technology discussions. The science communication overcomes the classical processes of mediated communication shifting to direct interaction between the sender and the public, driving towards a model pointed in 3 specific strategies (Pellegrini and Rubin, 2019, pp. 71–72):

1. The vertical one: featured by the direct dissemination of press release and scientists' statements to spread the research outcomes to a general public.
2. The dialogic one: featured by discussion events between experts and publics duly shaped on new scientific topics.
3. The participative one: the last strategy concerns the direct involvement of individuals in the research works in order to enrich the research purposes and shape the right interesting topics of investigation.

In accordance with this background, this paper aims to shed light on the current relation between scientists and citizens in Italy. Though a first exploration oriented around the scientists' social media presence, in fact, we will try to comprehend how they set their communication strategies and styles as a unit of analysis selecting the cultural products of their posting activities. For this reason, the empirical part of our work starts from a specific research question: referring to the topic of the current vaccination campaign, how do scientists communicate and approach the public on social media?

We tried to answer this question by first conducting explorative research related to the Digital Ethnography (Murthy, 2008; Coleman, 2010) in line with the Rogers (2009; 2013) vision of digital methods. We extracted the material directly connected with observed phenomena making a further primary use of secondary web data. Later, during the data collection, we set a quantitative content analysis of social media posts uploaded by selected subjects whom we observed on two specific social media platforms during the first 3 months of the vaccine dosing campaign in Italy, from December the 27th 2020 to March the 27th 2021.

Crisis Communication in the Time of the 2020 Pandemic

Through traditional and digital media, scientific communication has taken on an important role during the COVID-19 pandemic. In the specific case of Italy, it increased the exposure of several scientific experts: virologists, immunologists, and so on, who have provided to the larger public important scientific information about health, transmission, infection and, today, vaccination programs, and also proper instructions to follow concerning the correct behaviour to adopt to face the pervasive contagion (Brondi and Pellegrini, 2021). The speeches, often discordant especially in the first phase of the pandemic crisis, occurred on traditional media and social networks, with different styles.

The COVID-19 crisis poses significant challenges for how science is conducted and communicated (Lasser et al., 2020). The 2020 agenda setting "was substantially monopolized by the COVID-19 pandemic, the most prominent feature in the news of the year" (de Sola Pueyo, 2021, p. 1). This drove an *infodemic*, following Hua and Shaw (2020),

> "as the overabundance of information, sometimes not accurate, that creates difficulties for society to understand which resources to use to access reliable information" (de Sola Pueyo, 2021, p. 1).

Following Hussain (2020), through social and mass media it is possible to transmit a sense of unity due to large public coverage as well the opposite:

> "Social media may also provide grounds for misinformation and discrimination. People can utilize the flexibility and pervasiveness of social media technologies to increase the public's adherence to the safety measures suggested by global health organizations to combat the spread of COVID-19."

Following Bucchi (1996) in certain situations, usually connected to scientific controversies, scientists start to address the public directly by skipping the usual stages of scientific communication in the way that

> "these situations create a new modality in science communication that is associated with different objectives and tactics compared to the traditional dissemination pathways" (Olesk, 2021, p. 6).

In accordance with this assumption, the best way to directly address the public is through the architecture of a digital scenario and the disintermediated communication assets of the web environment, i.e., the social media sphere.

Social media platforms such as Twitter or Facebook ensure, in fact, support and resilience between communities, "providing direct access to an unprecedented amount of content and amplifying rumours and questionable information" (Cinelli et al., 2020, p. 1).

Furthermore, according to Hussain (2020), the specialists are involved in a time of crisis, such as the pandemic, to turn their expertise into communicating with their followers what's happening and the overall situation in their premises at local, national and international levels.

Among these, of course, there must necessarily be scientists with strong disclosure skills called to deal with proper communication on social networks.

Research Design

To better comprehend which scientists are involved in our exploration among the few who have progressively exposed disseminating their expertise on social media throughout 2020, we referred to a recent study by *Reputation Science*, a research center specialized in crisis management consulting, particularly in the scientific context.

Figure 1. *Virologists' Overall Classification*

Covid19: la comunicazione degli esperti

	Nome	Indice allerta (-5/+5)	Indice coerenza (0-10)
1	Fabrizio Pregliasco	4,45	9,67
2	Walter Ricciardi	4,00	6,41
3	Massimo Galli	3,80	7,57
4	Franco Locatelli	3,45	9,11
5	Roberto Burioni	3,45	4,21
6	Antonella Viola	2,86	7,49
7	Andrea Crisanti	2,60	3,05
8	Ilaria Capua	2,23	3,95
9	Giorgio Palù	1,86	3,09
10	Maria Rita Gismondo	-1,44	0,75
11	Alberto Zangrillo	-2,29	4,13
12	Matteo Bassetti	-3,42	8,02

Metodologia di analisi
L'analisi prende in considerazione le dichiarazioni pubbliche di virologi, medici ed esperti in tema di Covid-19 comparse sul web nel periodo 1 febbraio-20 novembre 2020.
Indice di allerta - indica l'opinione del soggetto in merito alle soluzioni per contenere la pandemia secondo una scala che va da -5 (situazione pandemica non grave, misure di contenimento minime) a +5 (situazione pandemica grave, misure di contenimento massime).
Indice di coerenza - espresso in una scala da 0 a 10 - mostra la coerenza delle dichiarazioni pubbliche durante il periodo di analisi.

Analisi a cura di REPUTATION SCIENCE

Source: Reputation Science.

This center synthesized an overall classification[1] concerning the scientist visibility on mass and social media from February 1st to November 20th. This classification

[1]COVID-19: The expert communication. Available at: https://www.reputationscience.it/analisi-

(shown in Figure 1) followed two specific indexes based on the scientists' public statements. The *alert index* concerns scientists' most frequent opinion related to the control and containment solution for the pandemic, while the *coherence index* concerns the contradictions of their public statements over the last year.

An in-depth inspection of the biographies of all the scientists qualified in this classification was done, and we selected 5 of them according to their social media presence.

The Selected Scientists

The first one selected is Roberto Burioni, an Italian scientist with an international profile. In 1988 he was a Visiting Scientist at the *Center for Molecular Genetics* at University of California at San Diego, while in 1991 he was Visiting Investigator at *the Department of Immunology* of the Scripps Research Institute in La Jolla, California (USA) where he worked in Dr. Dennis R. Burton's lab.

In 2004, Roberto Burioni worked as a *Faculty of Medicine and Surgery* at the University Vita-Salute San Raffaele in Milan. Today he is currently a Full Professor of Microbiology and Virology, as well as the head of an immunological research laboratory. His research studies concern the field of development of human monoclonal antibodies against infectious agents. Burioni became famous during the late 2010 years with his media interventions, especially on the issue of vaccines to counter disinformation on social media. His activity on scientific dissemination also reached TV platforms, allowing his reputation to gain more visibility. In November 2018 he opened a website: Medicalfacts.it, dedicated to scientific dissemination in the medical field. In 2019 he founded the Association "Pact for Science" whose goal is to enhance the scientific evidence at the basis of the legislative and government choices of all political parties. He published several books on scientific divulgation and for this he has won several prizes. From the beginning of the pandemic crisis until today, he appears as a regular guest on the TV program "Che Tempo che fa" conducted by Fabio Fazio which airs every Sunday at dinner time on the national broadcasting service Rai3.

The second scientist involved in our exploration is Ilaria Capua, a virologist of national and international fame. In 2000 she developed the strategy Differentiating Vaccinated from Infected Animals (DIVA): the first vaccination strategy against avian flu, whose test is able to detect whether antibodies in a subject were induced by the vaccine or infection. Ilaria Capua is responsible for an atypical action in the scientific field dated in 2006: she challenged the system - obtaining international resonance - deciding to make the gene sequence of the avian virus public. This sparked a conversation around the birth of *open-source science*.

In 2013 Ilaria Capua decided to run for the Italian Parliament being elected as the leader of her Civic Choice party. From May to July 2015, she was vice-president of the Chamber of Deputies in the Twelfth Commission (Social Affairs). She was put to criminal proceedings then acquitted (for conspiracy aimed at the commission of crimes of corruption, abuse of office and illicit trafficking of viruses) which caused considerable inopportuneness in her personal life. In September 2016,

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dagli-esperti-italiani-sul-covid-19-sovraccarico-di-informazioni-e-indicazioni-incoerenti/.

she decided to resign as a deputy and moved to Florida where she got employed as researcher. In the United States she heads a department of the *Emerging Pathogens Institute* of the University of Florida. She later became director of the University's One Health Center of Excellence. She is also currently a resident guest at *Dimartedi*, a program of the Italian Tv channel La7.

Furthermore, we involved Fabrizio Pregliasco, a researcher of the *Department of Biomedical Sciences for Health* of the University of Milano Statale. He is author of expert reports for *European registration of a vaccine and flu medication*. During his professional life he has collaborated in 12 clinical trials of vaccines and antiviral treatments. In 2015 he was selected as Director of Health at the Galeazzi Orthopaedic Institute in Milan. Subsequently he also became a consultant to the National *Council of Economy and Labour* (CNEL), as well as to the *National Council of the Third Sector* (social, economic and cultural reality in continuous evolution that includes bodies that are neither public nor commercial). Both these roles are carried out by the Ministry of Labour.

Since 2013 he has been the president of ANPAS (an association committed to provide public assistance). The efficiency in the activity of scientific dissemination is the primary reason behind the esteem that the community of experts has towards Fabrizio Pregliasco; during 2016 such an appreciation found concrete form in the conferral of National *Scientific Medical Union of Information* prize.

During the *coronavirus* emergency he is called to take on the role of scientific supervisor, a role assigned to cope with the many deaths that occurred in Milan at the *Pio Albergo Trivulzio*, a historic place of the city, residence for the elderly, which accommodates over 1,000 patients. After the numerous deaths and at the same time of the assessment of responsibilities, his role helped *Pio Albergo Trivulzio* to implement a new organizational structure. He is a sporadic guest in TV programs on La7 and Rai channels.

Antonella Viola is another scientist we observed in our research. She received a scholarship awarded by the European Research Council in 2014: two and a half million Euro in recognition of her STePS project, considered a revolutionary program with regard to the evidence on immune defenses against cancer. In the same year, she became associate professor in general pathology in the *Department of Biomedical Sciences* at the University of Padua. Today she is also a member of the scientific committee of the *Italian Association for Cancer Research*, as well as being an auditor for the European Commission dealt to the evaluation of scientific excellence projects. Thanks to her contribution to molecular biology, Antonella Viola became part of the *European Molecular Biology Organization*.

Finally, in parallel to her teaching and laboratory activities, she's responsible for promoting scientific dissemination, especially in the framework of the *European project Eufactor*[2]. Viola is also particularly appreciated as a speaker; her

[2]The project of 2016 is aimed at young people between 16 and 19 years and was created to raise awareness of the study of science, technology and computer science, directing them towards training and professional paths that offer more opportunities, but they are often discarded because they are considered difficult or boring. The campaign also targets stakeholders and the general public, to draw attention to the importance of science and technology and to give visibility to the European Union's commitment in these areas.

clear style leads her to travel the world as a speaker at conferences at prestigious institutions. Among the most appreciated speeches are those at TED Talks. She is a sporadic guest for TV programs on La7 Channel and on Radio tune *Radioradicale*.

Finally, the last scientist selected is Alberto Zangrillo, head of the *Operative Unit of Anesthesia and General Reanimation and Cardio-Thorax-Vascular*, Head of Clinical Areas of the IRCCS at the San Raffaele Hospital in Milan and collaborates at the *La Madonnina Nursing Home*. He is a pro-rector professor and Full Professor of Anesthesiology and Rianimation. Following SCOPUS[3] sources, today he is one of the top ten doctors in the world for the number of publications in the field of anaesthesia and intensive care, author of 800 publications, of which 400 are indexed in international journals which include randomized studies in *The New England Journal of Medicine, JAMA, Circulation and British Medical Journal*.

His media experience is linked with the former Prime Minister Silvio Berlusconi. Zangrillo has always been at his side, especially in the most difficult moments for his health, such as on 13th December 2009 when Silvio Berlusconi (at that time Prime Minister) was hit by a small statue; or seven years later, when the leader of the centre-right party was subjected to a complex cardiac intervention at the San Raffaele.

By virtue of its authorial activity, he collects numerous awards and honours from the scientific community. Also, the institutional offices seem to recognize the merit and confer the merit titles by the Presidents of the Italian Republic, Carlo Azeglio Ciampi and then Giorgio Napolitano. He takes part sporadically on TV programs on Rai, Mediaset and LA7.

Methodology

Social Platforms and Data Collection

As context units, we selected two specific social media platforms: *Facebook* and *Twitter.*

In the recent study of the Yearbook of science Technologies and society, Pellegrini and Saracino (2019) from the research center *Observa – Science in Society* showed interesting results related to how *Facebook* turned out to be a very suitable social platform where Italian citizens are reached by scientific-health centered content, and through which the public fruition becomes more frequent. On the other hand, Twitter turned out to be the opposite (Table 1).

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[3]SCOPUS is currently the largest bibliographic database of abstracts and citations of scientific literature. Index over 17,700 titles of scientific, medical, technical and humanistic journals, published by over 4,000 publishers. Among the most important citation functions Scopus allows to obtain: the H-Index or Hirsch Index (proposed in 2005 by Jorge E. Hirsch of the University of California at San Diego), is a bibliometric indicator that measures the impact of authors within the reference scientific community, based on number of publications and number of citations received; -to carry out the citation analysis of the authors and their relatives publications (through the Citation Tracker); to carry out the research and analysis of the authors' profile and membership affiliations.

Table 1. *Reading and Sharing of Contents Concerning Health and Medicine (Valid % N=978)*

	I read contents about health and medicine			
	Never	**Sometimes**	**Frequently**	**Total**
Facebook	25.5%	52.7%	21.8%	100%
Twitter	67.4%	24.6%	8%	100%

Source: Pellegrini and Saracino (2019), *Yearbook of science Technologies and society*, An insight on the relation between scientists and publics.

According to this evidence, more scholars (Schultz et al., 2011; Eriksson and Olsson, 2016) argued about the perceived usefulness of *Facebook* and *Twitter* in crisis communication. Compared to other sources related to the digital scenario, Twitter leads to less negative reactions than blogs and newspaper articles, while Facebook results in a higher reputation and less secondary crisis reactions than crisis communication via an online newspaper (Eriksson and Olsson, 2016, p. 200).

On the base of these assumptions, we started the data collection procedure on Twitter using the *scraping* procedure via *Python syntax*, while for Facebook we used *CrowdTangle*, an insight tool reserved to the academic hub that only tracks publicly available posts on Facebook, Instagram and Reddit.

The data have been collected following the structure of a proper standard gather grid (Losito, 2003; Amaturo and Punziano, 2013) divided in 4 main domains (General information, Cross information, Engagement and Audiovisual and Text information) and then organized in a Cases per Variable Matrix composed by 1,306 observations[4] per 13 variables defined as follows in Table 2.

Table 2. *Standard Gather Grid*

General Information	Cross Information	Engagement	Audiovisual and Text Information
Account *(Viola, Burioni, Capua, Zangrillo, Pregialsco)*	**External Sources** *(No external source, Press, Institution and Government, Science Journal, Scientific Network, Scientific Press, Conference Promotion, Official website)*	**Like** *(Low, Medium and High Likes)*	**Audiovisual Description** *(No audiovisual elements, Data, infographics, Media promotion, Normative alert, personal promotion, Press screenshots, Scientific publication extracts, Social media screenshots, visual and logo, Web events)*
Date *(December, Early January, Endo of January, Early February, End of February, Early March, End of March)*	**Repost Account Source** (*original post, Repost from Press Institution and Government, Repost from Scientific network and Scientific Journals, Repost from other profiles*)	**Comments** *(No Comments, Low-medium comments and high comments)*	**Text** *(Post corpus)*
Platform *(Twitter, Facebook)*	**Tag** *(No Tag, Institution, Press and other profiles Tag, Scientific network and Scientific journals Tag)*	**Share** *(Low, medium and high share)*	**Text length** *(Short, medium and long length)*

[4]All the posts were composed in the Italian native language.

Post Type *(Tweet, Retweet, Tweet Photo and Video, FB Status, FB Status Repost, Facebook Photo and video, Facebook Photo and video Repost, FB Link)*			

The selected scientists' profiles are situated in the account variable while the date variable concerns the month when posts have been uploaded. All content have been classified according to the platform uploading (Twitter and Facebook), and so too its classification unit (audiovisual or textual) duly specified in the post-type variable by which furthermore come possible to recognize the original or repost content.

The external sources concern the context from which comes the external links tied to the posts while the variable named Repost Account Source concerns the categorization of the account from where only reposts come. All Tags in posts have found place by a right categorization of the other mentioned social media accounts. As for the engagement, *likes*, *comments* and *shares* have been classified in tercile intervals that match low, medium and high engagement levels, while pictures and video descriptions have been categorized by the symbolic representation of audiovisual material posted in audiovisual description variable. Finally, we collected the text of every post as well as the text length, properly classifying them, following short, medium and long criteria cutting tercile intervals.

All the information contained in the dataset have been processed following multi-stage analytical procedures consisting of the application of the *topic modelling* aimed to point the features of the vaccination program discussion on social media during the timespan we observed. Then, it was processed in the application *Multiple Correspondence Analysis (MCA)* which makes it possible to detect the latent dimensions by which mark the correspondence between topics and the other context variables (platform, type of post, engagement and external sources). Later, the *Lexical Correspondence Analysis (LCA)*[5] turned out to be the best way to a right synthesis of the collected data; by a compact graphic representation of data relations projected on factors, we could point concepts not previously observable by which find the right key-interpretations based on the correspondence between the selected variables and most characteristics words of post texts.

[5]The LCA is a factorial technique concerning textual data and useful to: synthesize information contained in texts; make graphic displays of association networks among words and between words and texts; show the connections between text and context data (Lebart et al., 1998).

Analysis and Discussion

The Topic Modelling

The post texts present a considerable amount of information by which is difficult to trace a semantic structure. For this reason, we offered the empirical base to a simple but statistically robust solution: the topic modelling.

As a first step, we imported the database in *T-Lab*, a specific software environment for the content analysis able to process proper patterns based on textual context. We submitted the text variable, consisting in the corpus extracted by Facebook and Twitter, to *T-Lab* thematic analysis procedure that is preceded first of all by the proper following automatic processes. Lemmatization consists of 1) the standardization of all the verb forms in the same mode; 2) the transformation of nouns and adjectives posed in singular number; and 3) the removing of definite-indefinite articles. The frequency threshold was set on 20 occurrences which led us to exclude all the words below this frequency value and finally reducing the database to 650 total words in the analysis. Finally, we proceeded with the exclusion of empty segments found insignificant or irrelevant to our analysis. Later we setup the modeling aimed to the topic extraction based on the *Latent Dirichlet allocation* (LDA),

> "a generative probabilistic model for text document collections based on a three-level hierarchical Bayesian model, in which each item of a collection is modeled as a finite mixture over an underlying set of topics. Each topic is, in turn, modeled as an infinite mixture over an underlying set of topic probabilities. In the context of text modeling, the topic probabilities provide an explicit representation of a document" (Blei et al., 2003).

Following this procedure, we extracted 10 topics properly renamed, respecting statistical criteria, such as the consideration of specific word occurrences featuring the topic, as well as the low-high shared words occurrences among all topics, and by the *semantic tagging* (Bolasco, 2013, p. 126) on selected content in order to "detect the right document meaning solving disambiguation and identifying concepts by a set of words."

Finally, we classified the 10 topics considering the 985 emerging elementary contexts intended as the document analyzed fragments in which the topic itself comes more relevant.

Following Habert (2005), in fact the more significance parts of documents are regarded by the information weight of its fragments featured by its discursive formulas, their position in the document, the specific weight of each word related to its scatter in the document, etc. In our case, the resume of elementary contexts in T-lab returned us to follow a hierarchical order based on the informative score of a single fragment, which text reduction had been synthesized by a 95% threshold. The emerged topics have been duly defined as shown in Table 3.

Table 3. *Topics Description*

Topic Name	Most frequent Words (Specific, Shared with high probability, Shared with low probability)	Elementary context examples
Virus Mutation	Variation, Virus, Our, New, Greater, Pandemic, Mutation, English, Government, South African, Sars, COV, Last, Child Bambino, Bring, Make, Feed, Hard	• What is the South African variation and why we worry about? Is a variation featured by 3 worrying mutations concerning Spike protein. The best known N501Y, usual also to the English variation and 2 others K417N and E484K further to increase the virus transmission. • The new viral variants distorted some of the data. The presence of virus variations in our country worries not only for their greater transmission power but also in the case of Brazilian and South African variation.
Effectiveness of Vaccine	Infection, Dosing, Patient, Before, Antibody, Use, Answer, Protection, Approve, Response, Serious, Demand, Base, Immune, Result, Generate, Immunity, Shape, Week, System	• The answer to a single dosing vaccination that must be administered twice, but it suggests that for those patients, we could think to new and different protection forms. We wait for the results of the second dosing. • The cover protection needs 7 days later the second dosing. The partial one 12 days later the first dosing. The news is “Outbreak in RSA in Prato” The fact that them were vaccinated or not one week before was not relevant.”
AstraZeneca Case	Vaccinate, People, Astrazeneca, Population, Decide, Uscire, Subministration, Receive, Problems, Respect, Event, Contagious, Address, Happen, Trust, Avoid, Tranche, Old people	• L'AIFA has decided to advise against the vaccine use for the over 55. The reason is because data are not available about the vaccine efficiency for this year range and because it is a less effective vaccine than the others that protects only 6 people every 10 vaccinated. Can we vaccine the 40 years old people who suffer from diabetes? • I receive requests from those who have been vaccinated with the AZ tranche temporary removed by ISS. The tranche is not defecting as you ask me. The removal is precautionary and if you vaccinated you don’t have to do anything. Fever is as this vaccine. No panic.
Relevance of Data	Data, Effectiveness, Risk, Effective, Clinic, Disease, Study, Modern, Demonstration, Lock, Safer, Subject, To limit, To work, Obtain, Community	• Do the vaccines work against the new variations? First data are here. A revised research conducted with data obtained by Moderna tells that the antibody generated by the vaccines mRNA continue to recognize the variations, but with less efficiency. Moderna has declared that has started to generate an upgrade of vaccines. • We based on pre-clinical data to declare that mRND vaccines let us hope that the infections could be stopped as well and that we have waited for other data never received. The mass vaccination held in Israel and UK let us to answer to this question basing on numbers and on the obtained data.
Preparation of Vaccine Campaign	Vaccination, Italy, Country, Us, Healthcare, Campaign, Scientific, Effect, School, Day, Citizens, Situation, Choose, to find, Amount, High, Serious, Take, Remember, Necessary	• I waited for a different atmosphere for this vaccination campaign. A hard mobilization, vaccination centers open 24h and a generous activism. A power, touching atmosphere, as a war, as a last chance.

Scientific Network	Years, Science, Put, Health, Woman, Life, Bus, Ilaria, Capua, San, Raffaele, Hospital, Pregnancy, Laboratory, March, Future, Human	• At San Raffaele we don't stop even during holidays! Here Ottavio Cremona, full professor in human anatomy who takes the vaccination against COVID-19. • I'm proud of this awesome multidisciplinar team IRCCS Ospedale San Raffaele Università Vita Salute San Raffaele!
Vaccine's Supply	Time, Arrive, Year, Production, Produce, Possible, First, Million, Think, Case, Delay, Available, Safety, Divide, Exclusive, United	• BioNTech, the company that pointed one of two mRNA vaccines has bought in September a factory from Novartis to be used for the vaccine production. Has been needed 28 days for the implementation, 60 to start the production the vaccine. • There's hype for the Russian vaccine Sputnik, thinking to a direct production here before to obtain the EMA or FDA approve. Overcoming the political and economic interest why should us interest this vaccine and not Johnson & Johnson? Both are based on the same adenoviral vector.
Response Capabilities	Pfizer, News, Dosing, Dayes, Protect, Europe, EMA, Phase, Hope, Publishing, Continue, EU, Problem, Leave, Great, Death, Italian, Start, Together, Chance	• "Good news. After millions of administrated doses (two also for me) the EMA confirm the safety of Pfizer BioNTech PS after the second dose I've a soft pain in the arm dopo, soft headache, but 15 days ago after a tennis match I felt worst. • The Pfizer vaccine seems to protect from the infection already from single dose. This is the better news of last times! We don't know how long last the immunity, so for now go on with the second doses respecting the schedule!
Scientist reputation	Burioni, Roberto, Doctor, See, EricTopol, Vaccine, Aske, Read, Tweet, Know, Iene, Rectify, Work	• I would spread the sources but newspaper will entitle as well "battle between scientists", "the doctors must agree each other before declaration" or the classic "nobody here is understanding". • In any case I am already famous. I deleted tweets and I don't go to bed worrying about reading the newspapers that will disparage me tomorrow or the tweet trolls who send me hate. Both are not important, and not pleasant. This is the reason why I deleted tweets.
Media Presence	Covid, Speak, Explain, Coronavirus, Text, Professor, Chetempochefa, Facts, Medical, Emergency, News, Virologist, January, FabFazio, Pandemic, History, Tell, Dangerous	• chetempochefa Tonight back #CTCF guest of ','fabfazio with the professor we we'll talk about the last news on the covid worsening in Italy and of vaccine situation, See you at 8pm on RaiTre. • Adnkronos #CovidItalia, ','"Real Variatons: real emergency "Covid Italy" Pregliasco "Variants real emergence. Following the virologist "we need focused actions and screening at school. The next three or four weeks will be the most difficult"

Multiple Correspondence Analyses (MCA): The Factors' Building

Further, the topics as active variables deemed useful for the factor building were pointed also to *engagement rates, platforms, type of post* and *date.*

Scientists' reputation and media presence topics characterized in the same way as both the two factors, while the topics Virus Mutation; Effectiveness of

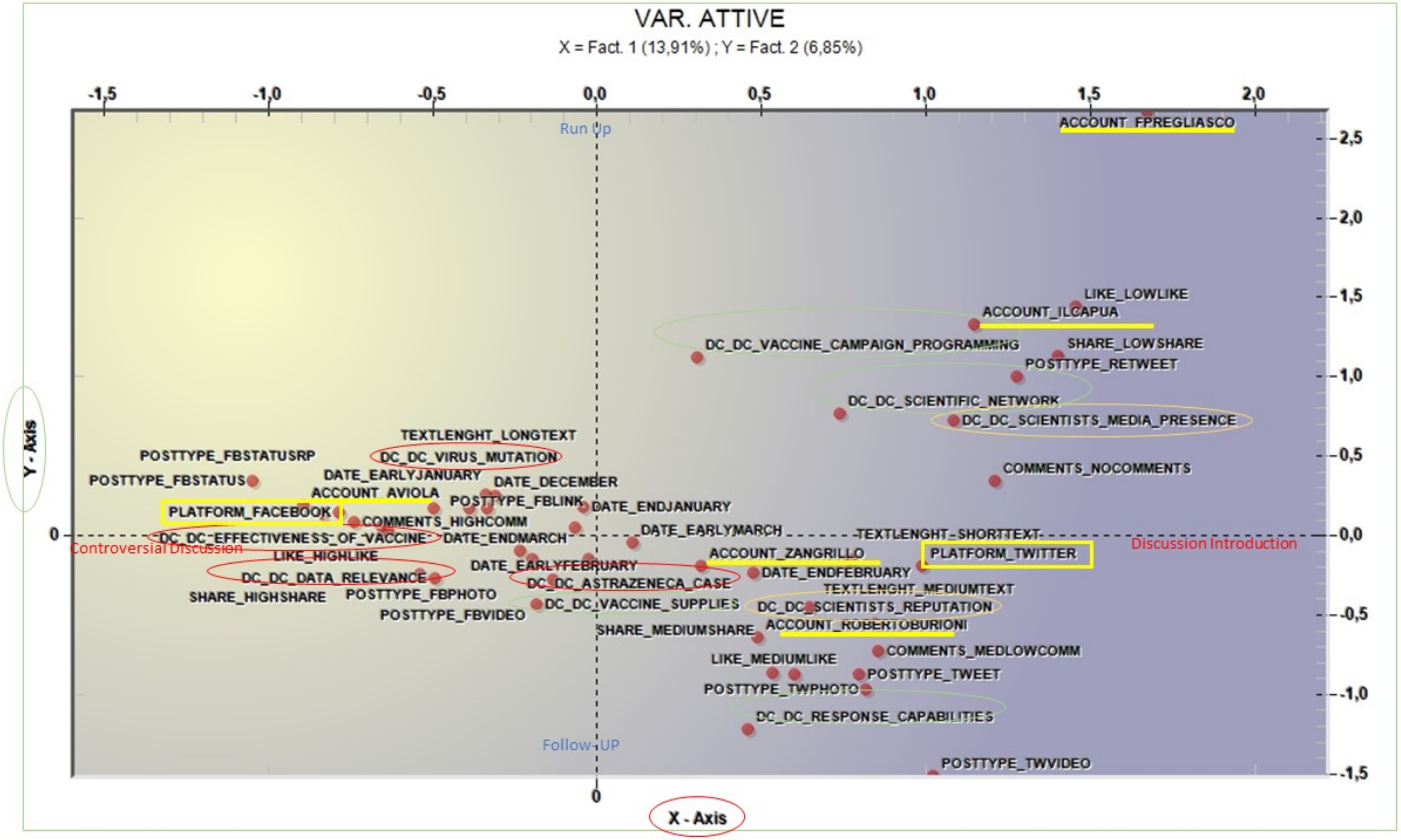
Vaccine; AstraZeneca Case; and Relevance of Data, instead, characterized the first factor, posed on the horizontal axis, which reflects the argumentations related to the vaccine clinical value assessment divided into two characteristic parts. As shown in Figure 2, on the right side, renamed *Discussion introduction* in fact, we can notice low engagement and no topics emphasized on the factor, while on the left side, renamed *Controversial discussion*, we can notice high engagement levels which appeared in February and correspond to the controversial and delicate topics such as the withdrawal of *AstraZeneca* batches and *Vaccine effectiveness*. For these argumentations, Facebook and its relative post types appear as the most-used platform by the observed scientists, while for the quieter discussion the elected platform is Twitter.

The second factor, posed on the vertical axis, is characterized by topics such as *Vaccine campaign preparation; scientific network; vaccine supplies;* and *response capabilities*. This dimension reflects the vaccination plan features and is divided into two specific phases of our timespan of observation. The first two months in fact reflect the *run-up* of the campaign while the last two months refers to the *follow-up* and rating of the ongoing process of the vaccine dosing program.

The plan synthesizes how most of the observed subjects are more addicted to Twitter posting practices compared to Facebook, which is preferred only by Antonella Viola. Most of them prefer a social media exposition on Twitter that, following Eriksson and Olsson (2016), connects the microlevel of interpersonal communication, the meso-level of follower–followed networks and the macrolevel of hashtag-based exchanges, while Facebook is usually preferred for horizontal support among users during crisis situation as the pandemic, in this case electing a posting-logic based on original contents (Viola, Burioni and Zangrillo) or on shared post from other social media accounts (Capua and Pregliasco).

Antonella Viola seems to be the only scientist open to controversial discussion. Her position on plan, in fact, clears how she benefits from high reactivity by her followers instead of Ilaria Capua and Fabrizio Pregliasco, more oriented to quieter exposition about the vaccine argumentation, whose posts are in fact characterized by low likes, comments and shares. Lastly, Roberto Burioni and Alberto Zangrillo's communication is characterized by a medium degree of reactivity of his followers. By the way, we must point out that the scientist of *Istituto San Raffaele in Milan* closed the comments options to all his followers, even those for his "following accounts" or the ones he spontaneously refers by a mention in the posts or in comments.

Figure 2. *Multi-Correspondence Analysis*

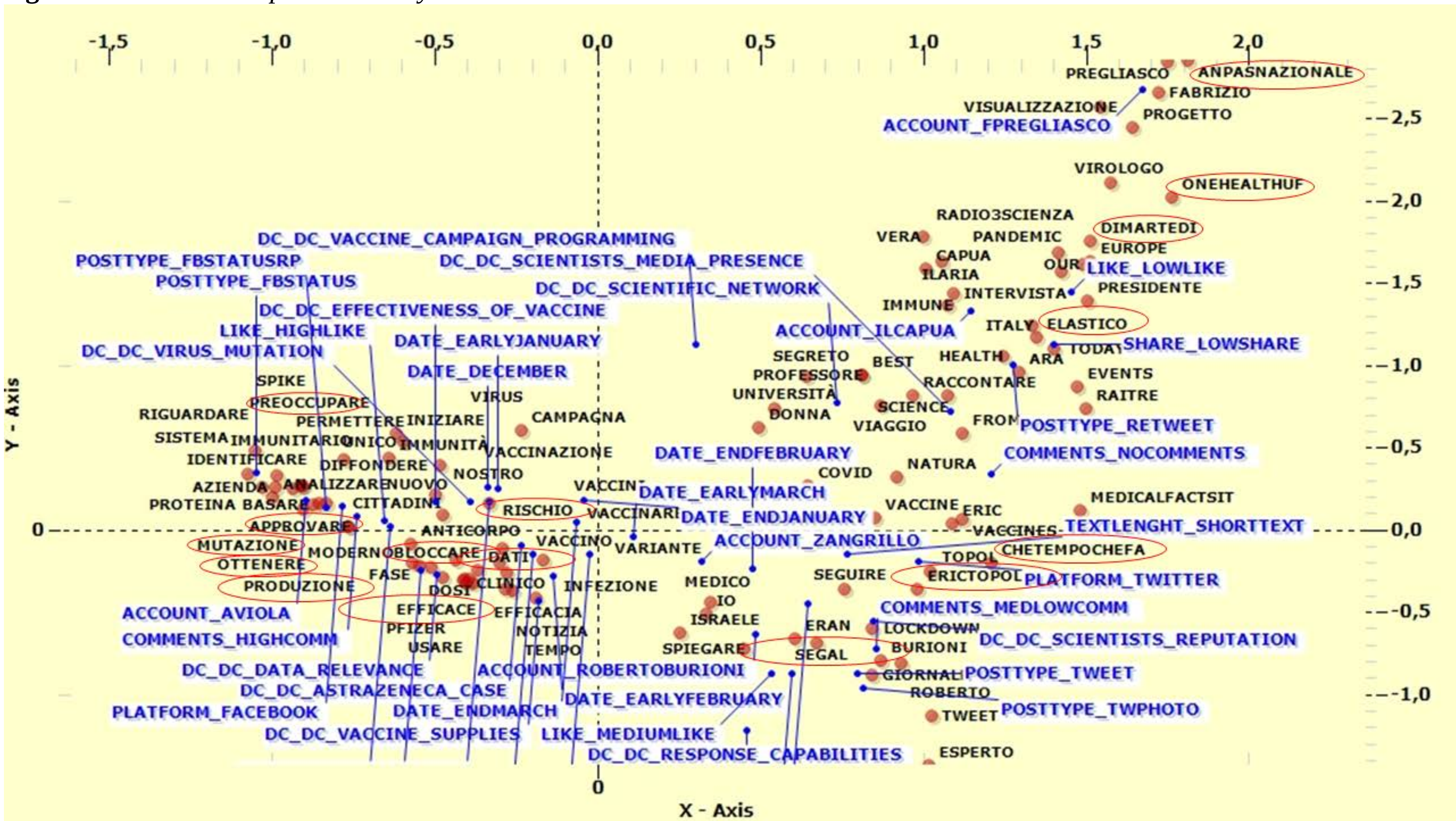


The Lexical Correspondence Analysis (LCA)

After this first analysis procedure, we synthesized the information contained in our data providing the further explorative step of *Lexical correspondence analysis (LCA)* and show graphically the multiple correspondences between words and context elements as for example who spread the message and the platform by which has been uploaded (Figure 3).

Starting from the right side we can see a relevant mass media exposition of the selected scientists. On both the up-down side are indeed marked words as: *Dimartedi*, the TV program that hosts Ilaria Capua; *chetempochefa*, the TV program that hosts Roberto Burioni every day at dinner time, duly complemented by the main character of their research network as; *One Health UF* and *Elastico*, the research centers and association tied to Ilaria Capua; *Eric Topol* and *Eran Segal*, two co-author scientist of Roberto Burioni; and *Anpasnazionale*, the association which Fabrizio Pregliasco is President. This content, posted over the timespan we observed and crossing the discussion introduction about the vaccine campaign, reflect how the positioned scientist in this side follow a kind of hybrid disintermediation made by *a social-mediatization process*. They, in fact, disseminate their statements via social media, originally conceived for mass media, finding on the web a new resonance chamber where the spread of the research outcomes is reluctant to react to Twitter's general public. On the other side, where the controversial discussion crosses the timespan observed, a dialogic strategy is applied by only Antonella Viola. The high engagement levels in fact remark an open possible discussion between the author and her public towards new scientific and mutable topics as the vaccines and its effectiveness due to the virus mutation as marked by words as: *risk, worry, mutation, production, effectiveness, data, lockout* etc. In this way, not relating with mass media frame, Antonella Viola looks as the only scientist truly according with a pure disintermediating process featured by contents thought specifically for the social media and the digital languages that promote a direct contact between sender and receiver, making outdated the figures deputed as intermediate in the communication processes.

Figure 3. *Lexical Correspondace Analysis*



Conclusions and Further Research Perspectives

This first exploration has finally shown how the most accredited Italian scientists set their public exposition related to the new media sphere. The main hybrid approach, followed by most of the scientists observed, can be related to several factors on which focus later for further needed deepening that must be planned also by continuing to follow the vaccination program and its communication trends held abroad. A further comparison between Italy and other European countries could be in fact useful to better comprehend these factors. More European countries such as France, Germany and the UK, in fact, frame the communication of science availing to few experts officially related to governments and institutional research agencies. In this way, the Italian framing turns out to be more liberalized in terms of contribution for the public scientific debate, suggesting that the distance from a pure disintermediated digital vocation could not only be related to the idea of Italy as a laggard country in terms of adaptation to the innovation in communication, while as sociopolitical context where arises a particular relation between science and politics. In this way, for example, we can wonder if the political sphere influences the scientific communication, scientists' interests, strategies and exposition styles related to this fundamental step fighting the pandemic.

Considering what has been shown, a further research perspective could be oriented on the base of the following hypothesis examples:

The social media use of Roberto Burioni seems to represent a resonance chamber of the framing processes he leads on TV, while Ilaria Capua adapts her twitter account as a promotion space, and her Facebook account as a press office managed by third people. Do they reject addressing controversial argumentation to protect their reputation and avoid troubles with the public broadcasting service? Does Pregliasco do the same to stay away from any ideological or political polarization misunderstanding of his government collaboration? Reading the *Science Reputation's* overall classification, Zangrillo has been qualified as the most contradictory scientist. Does he keep a low profile to avoid any other public embarrassment?

In conclusion, in light of this first exploration, it is evident that a more required deepening of the scientific communication frame worked during the pandemic era is needed, maybe starting from the above mentioned example-questions.

Moreover, since we are talking about a current and an in progress mutable phenomenon, we are forced to press further on our investigation following and observing the related events that feature the vaccination issue due to the multiple surprises and releases that the vaccinal program can reserve in terms of scientists' exposition in the public debate.

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Follow the Geographic Information: The Challenges of Spatial Analysis in Digital Methods

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In the digital environment, defined as a space with no anchors (Menduni 2014), the spatial dimension may have a significant role, mostly in relation to the Internet or digital studies. Social Media Geographic Information (Campagna et al. 2016), even if limited, can be highly useful to overcome some limitations of social media analysis and user generated content. With the objective to report the potential and limits of this approach, in this article a case study will be presented on the individual perception related to COVID-19 in Italy. Starting from the analysis of ecological data and the social media data, we reproduce three measures by exploring three different elements that could be anchored to a geographical dimension: the storytelling of COVID (COVID-Issues), the spread of infection (COVID-Spread), and the distribution of measures (COVID-Measures) to understand the regional trends of the second wave of the pandemic emergence that represent the timespan of this contribution.

Keywords: *geo-social media, twitter, ecological analysis, case study, API*

Introduction: On Space, Sociology, and the Study of Digital Diffusive Phenomena

The Role of Space Category in Sociological Studies

Space and its characteristics in the history of social theory and in the sociology of the twentieth century have not always played a central role. For example, Parson in his first elaborations argued that space was an irrelevant aspect for the analysis of social action. Due to this, some authors have critically spoken of sociology as an a-spatial discipline (Mela 2006). However, space has played a leading role in many works of classical authors such as Durkheim (Halbwachs 2018), Simmel (Cotesta et al. 2010) and Park (Mannella 2009). Durkheim, indeed, included space in his (never started) research program on "social morphology"; Simmel stated that space represented an integral part of his study of "social forms" (Frisby 2002), while in Park's work "human ecology", although with peaks biological determinism, space was one of the main dimensions. Nevertheless, in the recent debate, some relevant authors have tried to put the spatial dimension back into the core of social sciences. For example, in his project for the re-foundation of social knowledge, Giddens (1987) assigns a central role to the need

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to reconceptualize the role played by the notions of time and space into social change, and to overcome traditional disciplinary boundaries.

Although with different views and shades, the underlying idea of the cited authors is the belief that space, understood as a sort of habitat, is the result of a process of social production. Furthermore, space should be considered a dimension that can generate and even influence social phenomena.

Recently, thanks to big data seem to be renewed interest in the spatial dimension. In the data revolution era (Kitchin 2014), in fact, new data and new sources allow researchers to find new ways to study society and its dynamics. In particular, geo-located data enable better ways of producing social knowledge (Halford et al. 2013).

Thanks to the spread of smartphones and mobile devices, a class of geo-social software applications that integrates location has emerged. Twitter, Facebook, Instagram, Foursquare, as well as other social platforms, enable, through users' actions, the production of spatial datasets in which we can detect and locate individual perceptions, interactions, and experiences into physical space. This wide availability of geo-localized data led to the development of an approach, whose aim is to jointly analyze two worlds previously considered without meeting points: the online and the offline dimension. It becomes clear, in fact, that the virtual and material separation between the above dimensions, as is highlighted in spatial mediation theory (Leszczynski 2015), is entirely artificial.

This new space conception has emerged thanks to two new kinds of data: *Volunteered Geographic Information* (Goodchild 2007) and *Geographic Information deriving from Social Media* (Campagna et al. 2016). This kind of data shows higher spatial and temporal resolutions than the conventional data sources (i.e., census data and surveys; Batty 2013). Thus, the spatial dimension is becoming the object of increasing attention also in the context of the Internet and digital studies thanks to the availability of these geo-localized data. Chappell et al. (2017) argue that thanks to this kind of data, innovative methods can be developed to study social phenomena and to help sociology to avoid the "incoming crisis" (Burrows and Savage 2014) resulting from the increase of "social" data users.

Five Waves in Social Research on Geo-Social Media Data

The spatial dimension can indeed be declined in multiple ways as well as being conceived in a physical or non-physical way. There are at least five lines of research in the growing research stream that uses geo-social media.

In the first research line, there are works, that use geolocated data coming from social media, to explain how better manage different kinds of situations (i.e., emergency management). Event detection algorithms (Nurwidyantoro and Winarko 2013) integrated into social media monitoring systems use geo-located data to identify places hit by catastrophic events in order to intervene quickly. In addition, event detection algorithms are useful to identify emerging dynamics within the city that require immediate action (Wei et al. 2018).

The second research line aims to analyze the geographical characteristics of some social phenomena, such as the distribution of ethnic groups in large cities

(Longley et al. 2015) or linguistic diversity (Zhao and Cao 2017). Both these research streams are mainly descriptive and not always show a systematic integration of the study of the online world with the offline one.

This integration becomes central in the third and fourth research lines, where there are even more sophisticated theoretical frames. In the third research line, for example, there are mainly qualitative studies showing a focus on understanding how the online world influences the offline world. The more general aim is to understand how digital representations in social media could alter the meaning and the perception of physical environments through visualization and naming, and therefore how the spaces of representation can change spatial practices (Rzeszewski 2018). Sutko and de Souza Silva (2011, p. 810) who investigate the connections between the social and the spatial through geosocial applications and services and their impact on the social production of space and the spatial production of society, underline the transformation of some relational dynamics, such as sociability analyzed and described by Simmel.

In the fourth research line, there are mainly quantitative works, and the focus is explaining the variability of the phenomena investigated through statistical models in which socio-economic variables are considered independent variables. Thus, this growing body of research which works at multiple levels of geographical detail, investigates the different ways in which the spatial dimension is related to what happens in the online world and in particular on social platforms. The last two research streams carry on the tradition of studies begun with authors such as Durkheim (1951), using the ecological approach to connect and explain social phenomena through their spatialization and territorialization (Zajczyk 1991).

Finally, these four research lines are followed by the fifth concerning the development of techniques to study and analyze the content of geo-located data coming from social media (De Falco et al. 2021).

Operationalize the Category of Space in Geo-Social Media Data Analysis: An Empirical Proposal

In our opinion, one of the most promising for sociological research is the fourth wave exposed to which we linked the main objective of this contribution that consists of reporting the potential and limits of this approach. To this end, this paper will be divided into sections. In the first, through a case study on the individual perception related to COVID-19 in Italy, we will see the potential deriving from the use of the spatial dimension in the analysis of tweets. The analysis, conducted at the regional level, will investigate, thanks to the use of topic modeling the regulatory, contextual, and geographic influences of the spread of the virus on the topics that emerged from them. In the second section, however, we will see what the limits of this analysis are and what dilemmas they pose to the researcher. Since this is an exploratory analysis, no conclusions are drawn in this study. But, we intend to leave the reader with an analytical procedure that will highlight the potential of geo-referenced social data to study particular phenomena and their normative and diffusive components.

Making a Geography of the Storytelling: The Case of COVID-19 and its Widespread Perception in Italy

Once learned the theoretical context in which the relationship between space and digital environment could find interesting developments, it would be useful to understand the empirical implications. Our example of research related to an application on geolocalized tweets on COVID-19 content coming from Italy (well known as one of the European countries most affected by the recent pandemic) in a period covering almost three months, from October the 24th to December 18th, 2020, that is the period corresponding to the second phase/wave of the emergency.

The aim of the research was to see if differences in the geography of infection had implications for the geography of social storytelling as well. The research assumed that the pandemic, at least in its initial phase, did not affect Italy uniformly. In fact, the first epidemic wave had a strong geographical pattern, identified in a very limited area of Lombardy, and then spreading to other regions mainly in Northern Italy. The idea was that due to the shift in the diffusion trend (concentrated in Northern Italy at the beginning and then spreading to the whole country in the second wave), a more cohesive storytelling about negative sentiments would also emerge from the digital arena. This question was addressed by analyzing the corpus of geolocated tweets produced in the second phase of the emergency. The scrape of tweets occurred during the period that goes from the renewed October closures to the partial pre-Christmas re-openings that characterized Italian governance measure of containment of the virus spread during that period.

However, we diversified three normative periods during this time span. The first, corresponding to "general limitations" (24th Oct. – 2nd Nov.), relates to the general measures in the DPCM of October 13th, 2020, reintroducing several general restrictions and the requirement for anti-virus protection. The second normative phase, "traffic lights" (3rd Nov. – 4th Dec.), is related to the introduction of risk scenarios (DPCM of November 3, 2020). For the first time since the pandemic started, it sets out a differentiation of measures for regions, depending on the severity of the epidemiological situation. The third, "Christmas norms" (4th Dec. – 18th Dec.), maintains the earlier instructions on risk ranges and introduces some limitations for the upcoming Christmas holidays.

Tweets were extracted using automated techniques via Twitter's API (Application Programming Interface), initiated in the R environment by "rtweet" package. It allows us to interface with Twitter and set up procedures that fit our extraction standards, including spatial data characteristics. Geolocated tweets were attributed to the region from which they are tweeted. The dataset consists of 11736 tweets, and it has been explored by combining text mining techniques and GIS analysis. This allowed us to map the most recurring themes in social discourse on Twitter. In this way, the thematic element can give rise to a territorial spread corresponding to *COVID-Issues*, the regulatory element can give rise to a territorial differentiation of governmental measures corresponding to *COVID-Measures,* while the diffusive element of virus contagion over the national territory gives rise to a final geographic measure of *COVID-Spread* of the virus.

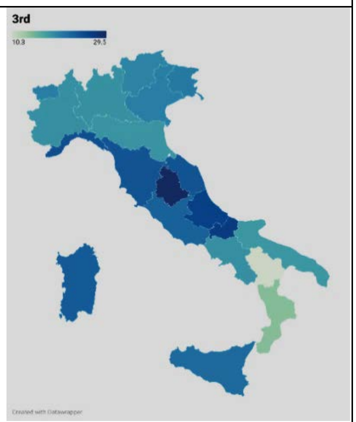
These are, precisely, three diffusive geographies that can be adequately produced and represented with GIS techniques.

The three emerging geographies, on the storytelling of COVID (*COVID-Issues*), on the spread of infection (*COVID-Spread*), and on the distribution of measures (*COVID-Measures*), were related to understanding the trend of this second wave of the emergence.

First of All: How much is posted in Each Region?

The potential of geographic information was summarized in a geographical representation of regions with the most tweets. The tweet spatial information allowed us to identify areas with more tweets. The maps allow a visual comparison within the three periods of observation (Figure 1). Depending on the periods, it can be noted how there are regions that are "darker" than others and that are often connected to more relevant crisis conditions. For example, Veneto in the first period is connected to a progressive emergency situation. In the second period, Basilicata, Calabria and Valle d'Aosta (likely due to the controversies connected to the attribution of the color for these areas). For the third period, most of the regions of the Center: Abruzzo, Umbria and Molise (e.g., the controversies related to the situation in Abruzzo, which sees the region in the red zone for a relatively prolonged period).

Figure 1. *Map of Tweets in the Three Periods, % on Tot. per Region*

1st Period (*General Limitations*)	2nd Period (*Traffic Lights*)	3rd Period (*Christmas Norms*)
		

The COVID-Spread Geography

The creation of *COVID-Spread* maps, i.e., the territorial spread of the virus in Italy, required the creation of a variable on the impact of contagion for each region (Figure 2). This is the ratio between the number of infections on the resident population, then the value was perceptualized and categorized on three levels (low, up to 33%, medium, up to 66%, high, for the remaining values up to 100%).

The cartographic representations below provide a summary for each period. It emerges that only in three regions has the impact of disease not changed - Sardinia, Abruzzo and Piedmont - where it has remained low, medium and high respectively. Others, on the other hand, have registered significant variability, in some cases tending to increase (Veneto, Molise, Puglia...), in others tending to decrease (Valle d'Aosta, Umbria, Liguria.). In any case, the overall situation changes a lot, but does not seem to improve significantly. Moreover, the concentration of the Virus remains high in the North of the country for the entire period.

Figure 2. *COVID-Spread*

1st Period (*General Limitations*)	2nd Period (*Traffic Lights*)	3rd Period (*Christmas Norms*)
		

The COVID-Measures Geography

COVID-Measures were categorized on the normative scenario prevalent within the three periods considered (Figure 3). As can be seen from the maps below, there is a trend gap with the impact of the virus, that is, with the likely "real" scenario of the emergency. As opposed to the maps on the *COVID-Spread*, for many regions there is a downward trend, as we go from very stringent regulatory provisions (red zones) for most regions, to a scenario of moderate risk (yellow zones) in the last period considered.

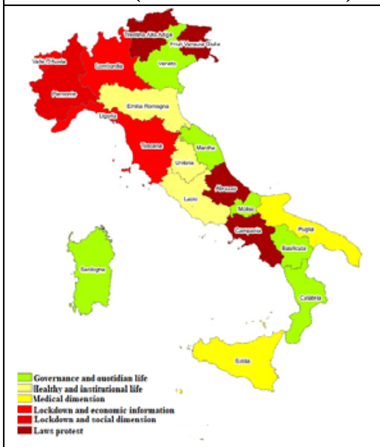
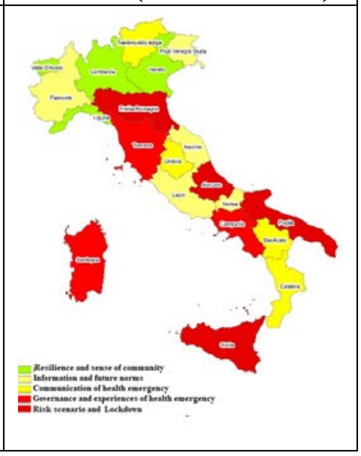
Figure 3. *COVID-Measures*

1st Period (*General Limitations*)	2nd Period (*Traffic Lights*)	3rd Period (*Christmas Norms*)
		

The COVID-Issues Geography

The creation of the *COVID-Issues* involved the analysis of the textual content of the tweets. The lexicometric techniques of the textual data and the application of automatic techniques of topic modeling and clustering were used, using T-lab software, according to the three normative moments considered. Summarizing the thematic content of tweets was appropriate for the extraction of the most relevant topics. The topics were then ordered along a continuum of emotions highlighting negative, neutral, and positive areas of perception related to the emergency. Ordering the emotional categories allowed us to use the same criteria as in the previous geographies, and this, in terms of comparison was very effective (Figure 4). Comparing the three maps, it is evident that the strongly pessimistic communication is concentrated in the Northern Regions and oriented mainly to social and economic problems and protests related to the return of the lockdown. This pessimistic scenario seems to be disappearing in the North and spreading in the rest of Italy and especially in some areas of the South. Here, in fact, discussions about pandemic governance and lockdown management seem to be taking over.

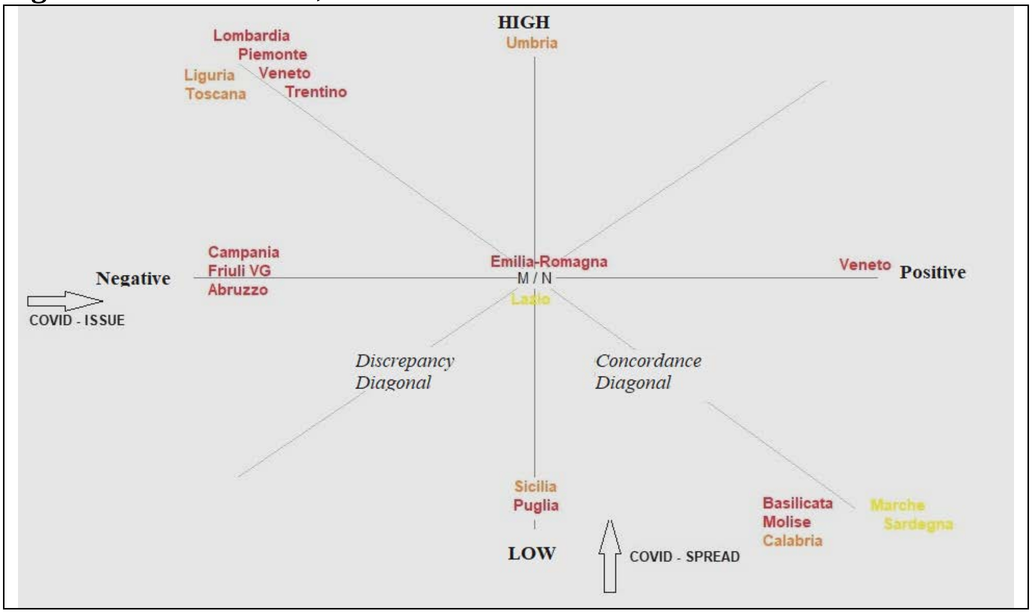
Figure 4. *COVID-Issues*

1st Period (*General Limitations*)	2nd Period (*Traffic Lights*)	3rd Period (*Christmas Norms*)
		

Representing Concordance/Discordance Profiles Starting from Different Geography

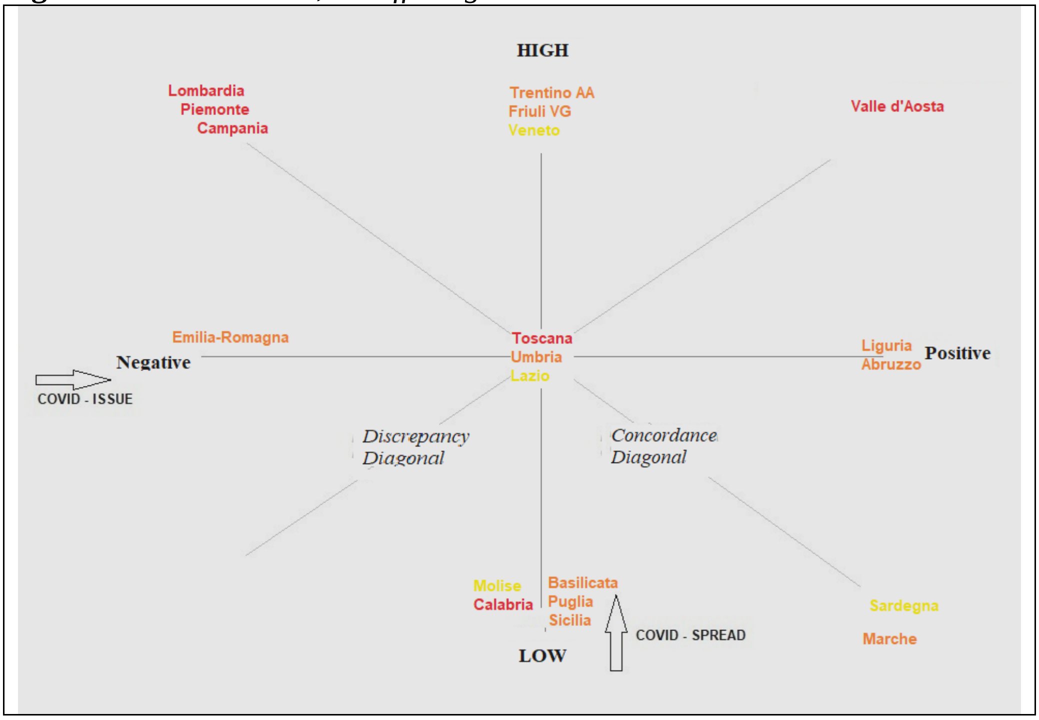
The monotonic nature of the three geographies encouraged us to attempt a synthesis to identify the degrees of concordance/discordance between the three levels, for each region. In this sense, the concordance between levels also represents the "expected" situation. For example, a critical outbreak situation (high impact) should predict a context of high restrictions (red zone) and, likely, a narrative with negative sentiment. If this reflection represents the obvious or the expected, a visual plane tool was used to both visually and simultaneously detect clusters of regions with similar concordance/discordance profiles (Figure 5). What we want to show with this visual model for the analysis of concordance and discordance is that the analyzed geographies do not always overlap and that some situations are recursive, and therefore deserve further investigation. If this could perhaps be the subject of a further article, here we will mainly clarify and test this ambition. Therefore, on the visual plane the x-axis delineates the *COVID-Issues*, the y-axis relates to the *COVID-Spread*, and the *COVID-Measures* are represented by the color of the Regions' labels, which guarantees the three-dimensionality of the plan. In summary, the comparison between the three situations revealed that the second wave of the emergency, at least regarding the three components observed, had a non-linear evolution, describing in some cases even rather contrasting situations.

Figure 5. *Cartesian Plan, "General Limitations"*



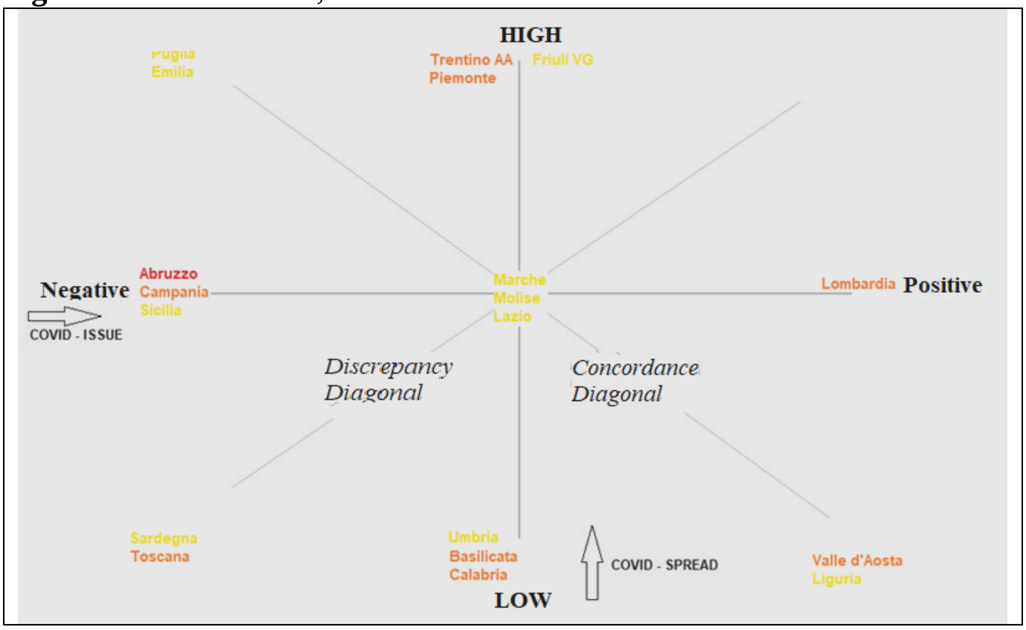
Following an early phase that was not difficult to interpret, with consistent groups of "red" regions with negative narrative polarity and other "yellow" regions with positive polarity (see the figure on the "General Limitations"), two other phases has been followed in which the relationship between contagions, narratives and norms progressively seemed to fragment. Beginning in the "Traffic Light" period, many regions "migrated" from the concordance diagonal to other points in the plane (Figure 6). This is a symptom of how the situation with the passage of time gave way to mixed feelings.

Figure 6. *Cartesian Plan, "Traffic Lights"*



The shift to the last period confirmed that the regions have hardly ever maintained their "positions" along this time continuum of ours, a sign of a rapidly changing situation. Probably the narrative of the emergency has gone in other directions than what the regulatory and epidemiological context could direct (Figure 7).

Figure 7. *Cartesian Plan, "Christmas Norms"*



In our case, the spatial analysis together with the analysis of the pandemic perceptions allowed us to hold together two new levels, which in "off-line" research conditions would probably have required a survey with its relative disadvantages (and advantages). Despite the enormous potential we have seen, this new way of doing research with digital data is not without its problems. It is also worth reflecting on the dilemmas that emerge.

Spatial Analysis and Social Media: The Dilemmas of a New Way of Doing Research

Main Conclusion Remarks

The analysis of the geolocalized tweets extracted during the second phase of the pandemic and explored in this study aimed to check if the digital area showed a more cohesive and unified narrative on negative feelings towards the return of the emergency with the change in the trend of its diffusion, which from being concentrated mainly in the North of the country in the second wave linked to the pandemic saw an increasingly homogeneous and fast growing trend.

The analysis carried out returned a complex and articulated picture, formed by multiple perspectives, here traced back to the *COVID-Issues*, *COVID-Spread* and *COVID-Measures* as attributes traced back to the space of their territorial distribution that characterizes them. In fact, this is one of the strengths of social media analysis, the possibility of mapping, defining, and describing all the meanings and associations attributed to a given topic under study.

Are These Limitations in the Use of Geo-Social Media Data or General Features of Analytics on Digital?

Beyond this enormous potentiality offered by the geo-referenced characterization of data deducted from social media with all their characterizations, there are many limitations that can be brought to the attention of the reader. Although for a certain percentage of the data collected on the Twitter platform it is possible to find the data related to the geolocation of the user who shares a specific content, it is not equally obvious that to that type of data the socio-economic-demographic characteristic of the user can also be traced.

More than a limitation of the use of geo-referenced data in the analysis of content coming from social media, this issue is a feature that characterizes all the analyses conducted on the digital scenario which, adopting the perspective that Rogers (2009) declines in the *Digital Methods* approach, are precisely identifiable in the locution post-demographic studies. These are analyses that do not take into account the traditional demographic characteristics of social research such as age, gender, level of education, and so on. In these studies, the individual user is not the unit of analysis of digital research, instead it will be considered as a part of social aggregates that cannot be traced back to socio-demographic categories but to activities (for example, users who comment on a certain Facebook page). What digital research allows us to observe, especially if connected to very specific criteria such as geolocation, are the activities (writing a post, putting a like, and so on) produced by the interaction between users and digital devices, activities of which the geo-referenced feature remains a simple attribute. The researcher cannot consider digital environments as a window on individual behaviors or personal characteristics of individuals that occur in the physical world, but rather as a strategic observation point of the actors' communication activities that take shape in the digital scenario. Investigating the interactions between users, and between users and devices allows us to capture opinions, value systems, symbols, and identities, that is, the cultural processes that emerge within digital environments. These processes, if usefully located in space can also be represented and mapped in the physicality they take on outside the Net.

What Potential Does This Data Push Beyond?

By immersing ourselves in digital data we can capture the shared culture and perceptions of users with respect to different social phenomena, which in the case of the pandemic can also be connected to meta-attributes that connote the physical space, such as the spread of the virus or the narrowness of the measures introduced to contain the spread of the virus.

The point of contact between the phenomena on the Net and the phenomena outside the Net can be traced back to the reduction of these attributes and meta-attributes to geolocalizable data and representable in the same space that makes the physical territory and the digital space two layers perfectly integrable in the study of complex phenomena. What is possible to do thanks to the use of geolocalized tweets is to analyze the influence of territorial characteristics on the phenomenon analyzed, which in our study is represented by the possible relationship, at the regional level, between the spread of the virus and the type of prevailing narrative.

A first result that this possibility offered by georeferenced social data gave us, led to the evidence that a discordance between the sentiment of the prevailing narratives and the spread of the virus was rarely observed. In regions where daily figures on the virus were high or otherwise concerning, predominantly positive narratives were rarely found and vice versa. In order to identify the second result of the analysis, it is necessary to consider not only the spread of the virus but also the differentiated measures that affected the regions. While it emerges that along the three periods the number of regions in which the linear relationship between virus spread and prevailing narrative type exists decreases, it is also possible to note that in the three periods the "red" regions are rarely characterized by a positive narrative. What emerges is that in the second wave, more than the territorial spread of the virus, it was the type of limitations imposed and, therefore, the risk range that affected regional narratives. This result helps us understand the potential of the transposition into spatial attributes of the characteristics investigated in the study, a transposition that made it possible to concretely answer the proposed research question.

Are other Pitfalls on the Shadow or are There Sediments of Innovation?

The issues related to the post-demographic research and to the transposition of certain given data in meta-spatial attributes are not the only challenge in working with geolocated data coming from social media. In fact, the issue hides other pitfalls relating to the APIs environment and data extraction procedures. APIs (Application Programming Interfaces) are a set of procedures that interface with an application to perform a specific task (extracting Twitter posts, for example). Tweets are public, so there are no privacy constraints. However, we are aware of the risks of automated extraction and the uncritical approach to building large databases (Hernandez-Suarez 2018, Leetaru 2019).

Four limitations can be recalled understanding how challenging it is to work with these procedures and data types.

The first concerns completeness: the APIs work by relevance and not by completeness, so at daily extractions some tweets are often missing from the roll call.

The second concerns the timing or the limit imposed by the proprietary platform of not being able to go back more than 7 days from the date of extraction, an issue solved here by adopting a strategy of extraction in real time. However, this component leads to visible limits.

The third concerns the daily number of extractions that, with the procedure used, is fixed at 18,000 per day. Although it might seem a lot, when you follow the hashtags used as those used for the extraction of the corpus in this study, there is partial amount of data existing in the network.

The last one concerns the limits for each call for which it is possible to extract a maximum of 100,000 tweets per object/hashtag followed. For these last questions, it is possible to find a solution subscribing to packages of extraction. These packages, however, are generally very expensive and are not always explicit in all the characteristics and the limitations that might incur. On the other hand, the Rtweet package add the possibility of selecting the extraction of only geo-referenced tweets, which then limits the number of tweets really useful for analysis and allows us to reach exactly the base of our interest. This extraction is done at zero cost, and this is no small advantage considering that social research is often lacking in terms of research funding.

These dynamics lead to reflection on issues related to how algorithms work and the ability to enter the dynamics of their construction. One of the limitations encountered by analysis with data from social media, in general, remains related to this issue.

All these reflections lead to questions in terms of the representativeness of the achieved results. As noted, both due to the percentage of Italian Twitter users and the extraction limits of the R package, the results are not generalizable to the entire Italian population. The population on the social then has well-defined characteristics that embrace only the most cultured, young, digitally skilled, and particularly interested in the dissemination and sharing of information not necessarily of a personal nature but rather aimed at a broader communication to large audiences and diverse interests. It is precisely because of this characterization that the opinions extracted from this social often display very polarized dimensions.

However, wanting to precisely explore these oppositions in the *COVID-Issues* putting them in interconnection with the attributes of *COVID-Spread* and *COVID-Measure*, in this study more than assuming the character of limitation this characterization becomes a real potential for georeferenced analysis interpretable as real sediments of innovation in social research on spatial category and diffusive phenomena.

There is no doubt that these are only open questions and far from a precise definition, but they open the field to appropriate debates in social research that is facing the digital component moving in the physical space of the our world where the research is designed and conducted and where problems under study find their space and their dimension.

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The Participation of Immigrants in Outside Home Activities in Finland

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The purpose of this study is to describe the views of immigrants on outside home activities and the support they have received. The data were collected via semi-structured questionnaires (n=113) during 2019 and analysed using statistical methods. The open questions were subjected to thematic analysis. The respondents' mean age was 41 and they came from 29 countries. Fifty-seven percent of the respondents participated actively in an association or group. Participation had a positive correlation with their ability to speak and understand Finnish. A principal component analysis performed on the causes hindering participation produced seven factors, which explain 70% of the phenomena. The greatest causes were: 1) cultural rules, 2) fears and lack of skills, 3) lack of a computer and computer skills, 4) lack of time, 5) the costliness, 6) food and customs culture and 7) lack of a car. Causes supporting participation produced two factors: 1) Finnish friends, neighbours, authorities, other immigrants and study and work friends and 2) one's own parents and family. This study reinforces earlier results about the advantages of participating in activities in learning the language and integrating into the culture and the environment of the new country.

Keywords: *asylum seekers, integration, immigrants, outside home activities, third sector*

Introduction

The migrant crisis of 2015 saw more than one million people, mainly from Iraq, Syria and Afghanistan, seeking refuge in Europe. One of the countries affected was Finland, which gave 2915 residence permits in 2015 and must thus integrate them (Ministry of the Interior 2017).

The integration of immigrant women who are in a vulnerable position is particularly difficult, as the state's child home care allowance allows them to remain at home to care for their children (https://www.kela.fi/web/en/child-home-care-allowance). The three-year allowance is seen as too long and passivizing

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(OECD 2018). It also affects the integration of the family's children, as being cared for at home gives them fewer contacts with Finnish society.

The integration of immigrant women and their children would be helped if the women were offered low-threshold opportunities to participate in activities such as helping older Finnish adults (e.g., DeSilver 2015). This would also help them learn the language. According to the OECD report (2018), the official Finnish education system is not succeeding in teaching immigrants Finnish.

There have been good experiences of immigrant women and older adults working together in Austria (Loferer-Lainer 2019). Older adults help women integrate through concrete actions such as offering their own home as a space where they can work together on everyday tasks, sometimes even without a common language. There are many lonely older adults in Finland who need company and help in managing their lives (Uotila et al. 2010).

The study reported in this article is part of an EU-funded project (SMDno-2018-1819) whose aim is to strengthen immigrant women's participation in society and to improve their integration. The project is developing, in cooperation with immigrants, a training model for immigrant women that prepares them for social participation by familiarizing them with Finnish culture, ways of communicating, the social and welfare service system and work culture. The project aims to create opportunities for immigrant women to spend time with older adults and network with home care professionals. The contacts they form would ideally continue after the project has ended. The project seeks to advance cooperation between immigrant women and organizations offering services to older adults and to encourage the women to move from home to participating in society (Salin 2019).

The position of immigrants, regardless of their education background, is weaker than that of the majority population on the job market. This is particularly true of immigrant women. Only half of all immigrant women living in Finland are employed. Those with a low education level or weak job-seeking skills or networks are in a particularly weak position. Internships, hiring allowances and networking initiatives to employers may offer a window into working outside the home (Larja 2019). This article examines the participation of immigrants in activities outside the home from the perspective of social integration and well-being. In this study, outside home activities refer to sports, performed alone or in group, and various hobbies such as participation in associations.

Literature Review

It is important to note that immigrants are not a homogenous group. They are from different cultures and countries and have left their countries of origin for different reasons. Some are asylum seekers while others have moved to Finland for work. The question of how to improve their integration is however relevant to all of them. In this study, 'immigrant' refers to people from foreign countries who have received a Finnish residence permit.

Studies show that speaking the language, education and work are the best ways of integrating into a new country. Learning about work culture through internships may give immigrants opportunities to be active members of society, which also eases their cultural integration and learning the language (Gupta and Sullivan 2013, Calzada et al. 2016, Akua-Sakyiwah 2016). Studies show that leisure time activities are also important in integrating immigrants to a new culture (Gerber et al. 2012, O'Driscoll et al. 2013, Koca and Lapa 2014, Kim et al. 2016, Lenneis and Pfister 2017). The topic still requires further research (Zacheus et al. 2011, O'Driscoll et al. 2013).

A new sociocultural context offers immigrants and their families opportunities to enrich their lives. Women in particular appreciate gender equality, which allows them to plan their lives in ways that would not have been possible in their countries of origin (Khawaja and Milner 2012, Gupta and Sullivan 2013). Women's liberation and independence may also cause tensions in family dynamics (Khawaja and Milner 2012). Lenneis and Pfister (2017) find that women's experiences of leisure time are not universal, as they are greatly affected by age, the nature of their work, living conditions and social factors such as ethnic and cultural background. Women described leisure time as all the factors that supported their physical, emotional and spiritual health (Suto 2013). Immigrant women in particular should be encouraged to pursue physical activities during their leisure time by emphasizing their benefits related to health, relaxation and social contacts (Zacheus et al. 2011).

The Western conception of time is often different from that of immigrants' countries of origin (Gupta and Sullivan 2013, Suto 2013). A strict conception of time and the scheduling of everyday life are a way of life that requires adjustment. Scheduling their days makes women feel like 'organizers or conductors' (Suto 2013). A lack of time has been found to lessen the creation and maintenance of friendships both with members of one's own ethnic group and with others. Women may hold two minimum wage jobs while going to a language school. It can be difficult for them to find time and energy for physical activities, as they have more duties to their families than men (Lenneis and Pfister 2017). Immigrant men have been found to participate more in physical activities than women (O'Driscoll et al. 2013). A study conducted in Finland also found that immigrant women participate less in physical activities than immigrant men and the majority population (Zacheus et al. 2011). It is also easier for men to enter physical group activities, as they tend to be braver than women. Issues related to immigrant men's participation also tend to be handled better than those of immigrant women (Zacheus et al. 2011).

However, studies also show that immigrant men can feel their opportunities decrease in the new country. Many prefer to live in areas with other immigrants, which hinders their integration (Avenarius 2012, Khawaja and Milner 2012). Men even use their isolation as a survival strategy, through which they resist the new culture by e.g., maintaining their authoritarian and patriarchal role in the family (Khawaja and Milner 2012). Systematic literary reviews conducted by various researchers have found strong evidence for the positive effect of physical activities and sports on integration (Gerber et al. 2012, O'Driscoll et al. 2013). Intervention programs that seek to aid integration through physical activities should thus be directed particularly to those with difficulties in integration (Gerber et al. 2012).

Maintaining bonds with one's culture is important, as it protects immigrants from e.g., mental problems (Cuevas et al. 2012). Castaneda and Kuusio's (2019) study conducted in Finland found that supporting immigrants' and their descendants' social networks also has a positive effect on their integration and health. A large-scale Finnish study found that immigrants from several language groups were united in seeing friends and family as extremely important for one's personal identity (Pitkänen et al. 2019). Traditional family roles and the lack of social networks are detrimental to women's integration in particular (Phan et al. 2015).

Work and having a profession have been shown to lessen immigrants' pain of separation from their country of origin and loved ones, as they keep their minds busy. Separation is more traumatic to those whose friends and family have disappeared as a result of war or are scattered throughout the world (Gupta and Sullivan 2013). They may suffer from post-traumatic stress disorder, which explains why participating in physical activities or even considering it is not a priority for them (O'Driscoll et al. 2013).

Previous studies show that immigrants have few contacts with the majority population not derived from work or education (Avenarius 2012, Gupta and Sullivan 2013). Civil servants such as social workers, language teachers and schoolteachers offer immigrants valuable help in integrating into society (Gupta and Sullivan 2013, Suto 2013). Avenarius (2012) finds that the shrinking of women's social networks and the lowered frequency of contacts are not solely negatives, as they also mean a lessening of responsibilities and duties compared to life in their countries of origin. According to a study conducted in Finland (Zacheus et al. 2011), immigrants' low participation in physical activities was caused by both practical reasons and cultural differences. Hindering causes included a lack of information and money and lacking language skills. According to a Swedish study (Jönsson et al. 2012), language skills had a meaningful correlation with leisure time physical activities (cf. Gerber et al. 2012). The better the immigrants' command of Swedish was, the more they participated in physical activities. Immigrant women wanted to do physical activities together with other women rather than alone. Such groups would offer a natural way for immigrants and the majority population to become familiar with each other (Zacheus et al. 2011).

In many cultures religious activity offers a natural setting for socializing with people from the majority population as well as other immigrants (Gupta and Sullivan 2013, Kim et al. 2016, Pearce et al. 2017). According to immigrant women themselves, community centres are important in building resilience. Communal meals are one way of understanding between cultural groups, as is offering physical space for cultural expression such as religious rituals, language and family values (Pearce et al. 2017). A Korean study (Kim et al. 2016) found that leisure time activities can aid the integration of immigrants into Western societies. Participation in hobbies and indoor activities predicts a successful integration, while immigrants' participation in cultural and voluntary activities within their own immigrant society predicts a failed integration.

Immigrants' professional choices, living routines and personal habits can be difficult to change due to their physical environment. They often live in areas where the lack of public transportation prevents them from going to stores, gaining an education and finding work (Gupta and Sullivan 2013), as such important locations are rarely within walking distance of one's home (Ho and Cheung 2011). Immigrants' command of the local language is often lacking, which makes it difficult for them to gain a driver's license, which would ease their movement. Shopping and other activities are important for maintaining women's social connections, as they enable them to meet their friends (Gupta and Sullivan 2013, Suto 2013). According to a Finnish study (Zacheus et al. 2011) women from Muslim countries in particular needed physical activities to have a practical purpose. For instance, they found it difficult to go for a walk if it did not have a destination. Some considered taking care of their home physical activity and did not see the need for more of it.

Maintaining immigrants' own culture in a new country requires great effort, particularly from women. According to Ameeriar (2012), immigrants feel otherness, even if their grasp of the local language is good. According to a study conducted in Finland, as many as 40% of immigrants experience some form of discrimination (Rask and Castaneda 2019). Research shows that experiences of otherness force immigrants to redefine themselves in a new context, which is not easy for them. Cultural differences hinder women's integration in particular. Many even change their own behaviour in public and abandon cultural practices under social pressure (Gupta and Sullivan 2013). According to Walseth and Fasting (2004), most European studies on immigrant women's leisure time physical activities found that the obstacles to their participation are related to culture, religion or racism. Those who organize physical activities do not offer opportunities that consider immigrants' cultural characteristics.

As part of their identity, immigrants consider work and education extremely important, along with friends and family. Even unemployed respondents emphasize the importance of work (Pitkänen et al. 2019). Volunteer work has also been found to advance integration and social inclusion, particularly for women (Khorostianov and Remennick 2017, Loferer-Lainer 2019). This study examines the integration of immigrants into Finnish society from the perspective of outside home activities.

Aims and objectives

The aim of this study is to describe the views of immigrants with residence permits in Finland on outside home activities and the support they have received. The study answers the following questions:

1. How do immigrants participate in outside home activities?
2. Which factors hinder immigrants' participation in outside home activities?
3. Which factors support immigrants' participation in outside home activities?

Methods

Data Collection Instruments

The data were collected through a semi-structured questionnaire designed by the researchers for this study. The questions were about the following themes: a) respondent background (7 questions), b) education and language skills (4 questions), c) participation in outside home activities (3 open questions, 3 multiple choice questions), d) factors hindering participation in outside home activities (21 statements, available replies: never, sometimes, often, always), e) need for support in participating in outside home activities (11 statements, available replies: never, sometimes, often, always) and f) need for support in integrating into Finnish society (3 open questions and one multiple choice question). Some of the questions were ordinal scale variables (f=34) and some open questions (f=6). The questions were formulated based on earlier research literature, after which the questionnaire was sent for consultation to four professionals with long experience in working with immigrants. The questionnaire was then amended based on their suggestions by making the concepts used less ambiguous and clarifying the wording of the questions. The amended questionnaire was then pre-tested with five immigrants who have lived in Finland for years and have an excellent command of the language. Their response led to a few more clarifications on the wording and the layout. The questionnaire was then translated to Dari, Arabic, Somali and English by a translation agency.

Data Collection

The data were collected during autumn 2019 at three Finnish cities, which all have weekly activities aimed at immigrants. The activities are organized by the Evangelical Lutheran Church of Finland, other religious groups or secular third sector organizations such as the Settlement movement. The purpose of the activities is to offer immigrants diverse activities that aid in integration, help with services and teach Finnish and everyday skills. Immigrants can come to the activities freely without prior enrolment.

The data were collected at community centres meant for men (f=1), women (f=3) and both (f=2). The researchers visited the centres on days with activities ten times, during which they met with immigrants, introduced the project and asked them for their consent in participating in the study. The only requirement was a Finnish residence permit. The immigrants' attitude towards the study was positive, as all wanted to participate in the questionnaire. Some answered the questionnaire independently, while others did so with the aid of the researchers. The respondents were allowed to choose which language they wanted to use. Answering the questions took from 20 minutes to an hour. Responses in languages other than Finnish or English were sent to be translated to the same translation agency that had translated the questionnaire. There were 116 responses, of which three had to be discarded because the respondents lacked a residence permit. This left 113 responses to analyse.

Data Analysis

The data were analysed with the SPSS for Windows 25.0 statistics program by using percentage and frequency distributions, distribution statistic, Cronbach's alpha, the Spearman correlation test and factor analysis. Spearman's rank correlation coefficient was used to examine the dependencies between phenomena and variables, as the variables were chiefly on an ordinal scale. The level of statistical significance was defined as $p<0.05$. The causes hindering (question 17, 21 statements) and supporting (question 19, 11 statements) participation in outside home activities were subjected to factor analysis using principal component analysis and varimax rotation, with the goal of condensing the results and discovering explanatory factors.

The questionnaire's reliability was assessed by using Cronbach's alpha. The reliability of question 17, which deals with the causes hindering immigrant participation in outside home activities (n=21), was $\alpha=0.83$. The reliability of question 19, which deals with the causes supporting immigrant participation in outside home activities (n=11), was $\alpha=0.81$. The results are not presented by gender, as only 26% (n=29) of the respondents were men.

The answers to the open questions were analysed using thematic analysis (Vaismoradi et al. 2013). The first phase of the analysis consisted of reading the data several times to form a general picture. The chosen units of analysis were word, sentence or idea. These units of analysis, i.e., original expressions, described immigrants' participation in outside home activities and the support needed to integrate into Finnish society. During the second phase of the analysis, the original expressions were coded, compared and then collated into similar themes. In the final phase of the analysis, the frequencies for the contents of each theme were counted.

Ethical Approval

The study was conducted following good scientific practice (TENK 2012). Permission to conduct the study was given by the organizations. The cover letter accompanying the questionnaire explained this study and the project to which it belongs. The purpose of the study and ethically significant issues such as voluntariness, anonymity and the option of ceasing participation were explained in writing and orally. The filled questionnaires were returned in sealed envelopes. The identity of the respondents is not revealed by the questionnaires. Returning the questionnaire meant the respondent's conscious agreement to participating in the study.

Results

Respondents' Background

Of all respondents (n=113), 73% were women. The youngest respondent was 18 and the oldest was 78. The average age of the respondents was 41. They had arrived in Finland between 1983 and 2019 from 29 different countries. Most came from Afghanistan, Iraq and Nigeria (Table 1), and 85% had arrived in Finland in this century. They had lived in Finland for 0-36 years, the average being 11 years. Eleven percent had only a primary or high school equivalent education, 21% had a vocational school degree, 40% had a college degree and 28% had no education.

The respondents had 24 different native languages, of which Dari (f=12), Somali (f=10), Russian (f=8), Yoruba (f=6), Kurdish (f=6), and Arabic (f=6) were the most common. Six percent of the respondents (n=113) estimated their ability to speak Finnish as excellent and 31% as good. In their estimation, their ability to understand Finnish was slightly higher than their ability to speak it (Table 1). As their stay in the country increased, both their ability to speak (r=0.306 p=0.001) and understand (r=0.307 p=0.307) Finnish increased.

Table 1. *Characteristics of the Study Participants (n=113)*

Variable	n (%)
Gender	
Female	83 (74)
Male	29 (26)
Total	112 (100)
Age	
18-28	14 (13)
29-39	36 (34)
40-50	29 (27)
51-61	21 (20)
62-78	6 (6)
Total	106 (100)
Country of origin (three most common)	
Afghanistan	19 (17)
Iraq	15 (13)
Nigeria	10 (9)
Year of arrival in Finland	
1983-1999	17 (15)
2000-2010	45 (40)
2011-2019	50 (45)
Total	113 (100)
Ability to speak Finnish	
Excellent	7 (6)
Good	35 (31)
Satisfactory	43 (38)
Bad	24 (21)
None	4 (4)
Total	113 (100)
Ability to understand Finnish	
Excellent	13 (11)
Good	37 (33)
Satisfactory	37 (33)
Bad	23 (20)
None	3 (3)
Total	113 (100)

Immigrants' Participation in Outside Home Activities

Seventy-five percent of the respondents thought that their area of living offered enough activities for them and their family. Fifty-seven percent participated actively in an association or group. Of them, 34% participated in a Finnish-speaking association or group, 16% in an association or group that spoke their native language and 15% in both kinds of groups. Thirty-five percent had left this field blank.

The ability to understand Finnish correlated with finding the level of offered activities satisfactory ($r=0.267$, $p=0.005$**). The better the respondents estimated their ability to understand Finnish, the more likely they were to be active in a group ($r=0.251$, $p=0.008$**).

The open question 'what are your hobbies in your leisure time' was answered by 103 of the respondents. Athletic hobbies emerged most clearly, as the respondents listed 108 different sports. The most popular ones were walking (f=39), gym (f=14), swimming (f=14), jogging (f=9), cycling (f=8) and football (f=6). Volleyball (f=4), gymnastics (f=3) and dance (f=3) were also mentioned.

> *I exercise a lot when the weather is good*

The most popular cultural hobbies were reading (f=17), listening to music (f=7), watching films or going to the cinema (f=7) and drawing and painting (f=3). Other hobbies that were mentioned included writing poetry and singing in a choir. The respondents also had fun hobbies with their families (f=10):

> *I spend my free time with my family and we go to the library, the playing field or we cook*

Hobbies done at home included crafts (f=10), cooking (f=8), cleaning (f=3) helping others (f=2) and going to the sauna (f=2). Taking care of flowers, prayer and baking were also mentioned. Other hobbies included learning Finnish (f=8), going to community centres (f=7), meeting friends (f=4) and traveling to nearby cities (f=4). Shopping, camping, billiards, fishing and picking berries and mushrooms were also mentioned.

The open question 'what hobby opportunities would you like to have more of' received 79 replies. The most common athletic opportunity mentioned was swimming. Gyms (f=5), dance (f=5) and football (f=4) were also mentioned. Badminton, wrestling and flying were also mentioned. For responses wished for women-only exercise spaces, two ones for children-only exercise spaces and two for immigrants-only exercise spaces.

Many of the respondents wished for activities that could be performed together with Finns, which would allow them to integrate better:

> *Activities that improve integration and teach more about Finnish culture*

The replies showed a desire for togetherness and pursuing hobbies together. Helping other people was also of interest.

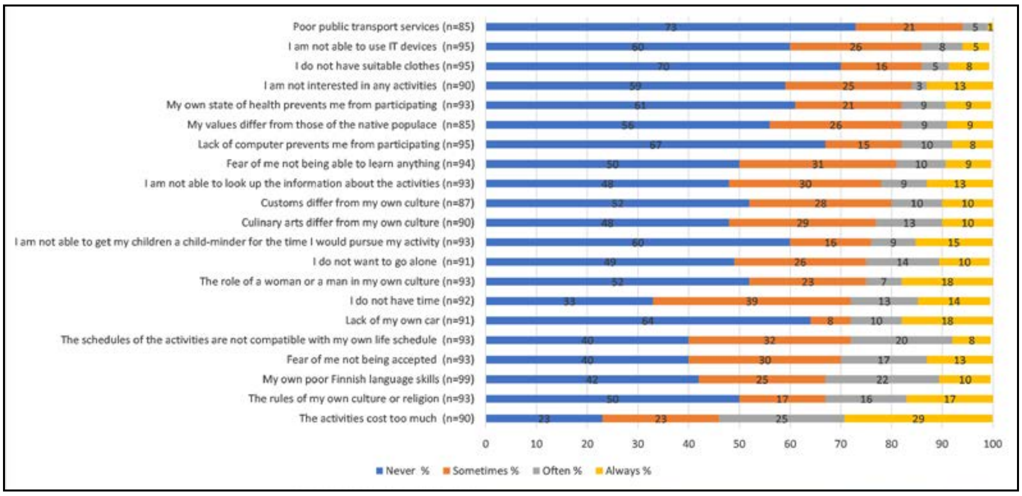
I live alone so I always want to spend time with people

Learning languages was seen as important, as along with Finnish (f=7), there was a desire to learn English (f=2) and Swedish. Respondents were also interested in travel (f=6), visiting museums (f=2) and learning about culture.

Factors Hindering Participation in Outside Home Activities

Factors hindering participation in activities were charted using 21 statements (Figure 1). Respondents were often or always hindered by high costs (54%), a lack of time (27%), fear of not being accepted by the group (30%), rules of one's culture or religion (33%), low level of language skills (32%) and schedules (28%). Factors such as the role of men or women in one's culture, differing culinary arts and an inability to find information about activities were somewhat hindering. Approximately a quarter of the respondents did not want to go to an activity alone or did not have a child-minder or a car. Some were afraid of learning nothing. Matters such as transportation, clothing, IT devices or health rarely hindered participation.

Figure 1. *Causes Hindering Immigrants' (n=113) Participation in Outside Home Activities*



Seventy-three percent of the respondents reported that they had never been hindered from participating in activities by a lack of transport services, 70% had never been hindered by a lack of suitable clothes and 60% had never been hindered by a lack of their own car. Younger respondents were less hindered by scheduling conflicts with public transport than older ones (r=0.284 p=0.005**).

Those who had lived in Finland for a shorter time were more hindered by a weak command of Finnish than those who had lived in the country longer (r=0.205, p=0.048*). The ability to speak (r=0.267, p=0.010**) and understand Finnish (r=0.300, p=0.004**) also had an inverse correlation with a fear of not being accepted.

Those who had lived in Finland for a shorter time had a greater fear of not being accepted than those who had lived in the country longer (r=0.253, p=0.017*). The better the respondents' assessment of their knowledge of Finnish was (r=0.244, p=0.018*), the less afraid they were of not learning anything.

The results show that the better the respondent's assessment of their ability to speak (r= .277, p= .008**) and understand Finnish (r=0.293, p=0.005**), the less hindered they were by culinary differences. The same applied to Finnish skills and IT devices (r=0.211, p=0.040*).

A principal component analysis performed on the statements in Figure 1 produced seven factors which explain 70% of the phenomena. The first factor (coefficient of determination 13%) includes cultural rules: gender roles, cultural and religious requirements and one's own values. The second factor (coefficient of determination 12%) includes fears and a lack of skills: the fear of not being accepted or learning anything, weak command of the language and an inability to find information about activities. The third factor (coefficient of determination 11%) includes a lack of a computer and computer skills. The fourth factor (coefficient of determination 9%) included a lack of time and problems with scheduling. The costliness of activities did not become relevant until the fifth factor, whose coefficient of determination is 9%. Food and customs culture in the sixth factor has a coefficient of determination of 9%. The seventh factor includes the lack of a car (coefficient of determination 7%).

The open question 'what else would you like to tell us about the things that make it difficult for you to participate in activities or groups' was answered by 50 respondents. The responses partially repeated the themes of the previous question such as a lack of money (f=10) and time (f=5) and problems related to health (f=6) and language skills (f=6). A lack of support (f=8) was mentioned frequently:

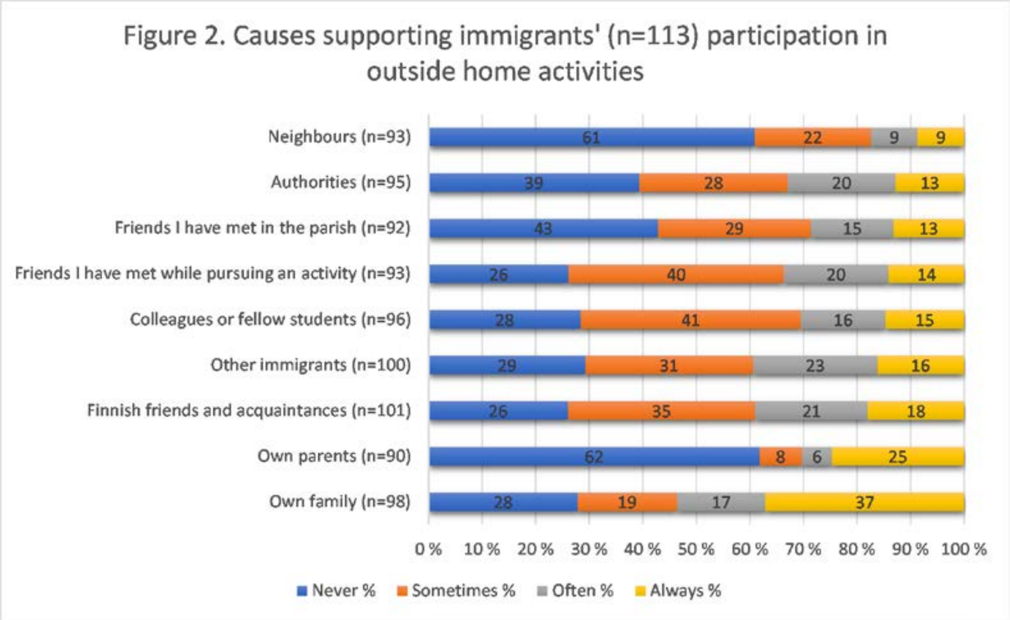
> *I don't yet have female friends [..] I don't know how to find such a friend through networks, since these things happen so fast these days*

Four responses hoped for a child-minder that would enable them to participate in activities, as some respondents were single parents. Some had difficulty finding information and some had found age limits in certain activities. Beginning a new activity was seen as difficult, as were Finland's cold climate and cultural and religious differences. The respondents did not know of activities in which Finns and immigrants could participate together, which they saw as a problem.

Factors Supporting Immigrants' Participation in Outside Home Activities

Participation in activities was often or always supported by one's own family (54%), Finnish friends and acquaintances (39%), other immigrants (39%), friends met during activities (34%) and work and study friends (31%). Approximately one fifth of the respondents were often or always supported by their neighbours. Other supporters included authorities and friends from the parish (Figure 2).

Figure 2. *Causes Supporting Immigrant (n=113) Participation in Outside Home Activities*



Sixty-one percent of the respondents never received support from their neighbours and 62% never from their parents. The younger the respondent the more likely they were to feel supported by their parents ($r=-0.241$, $p=0.030$*). Respondents who saw the amount of offered activities as sufficient felt they had received support in their activities from authorities ($r=0.377$ $p=0.000$***) and Finnish friends and acquaintances ($r=0.224$ $p=0.026$*).

A principal component analysis of the statements in Figure 2 yielded two factors with a coefficient of determination of 57%. The first factor (coefficient of determination 34%) consists of Finnish friends met in parishes, during activities or elsewhere, neighbours, authorities, other immigrants and study and work friends. Factor two (coefficient of determination 23%) included one's own parents and family.

Discussion

This study analysed the integration of immigrants into Finnish society from the perspective of outside home activities. Nearly 60% of the immigrants who participated in this study (n=113) participated actively in an association or a group. According to Castaneda and Kuusio's (2019) study, one indicator of high social well-being is participation in leisure time activities, which is a significant factor in supporting both immigrant's integration and health. Based on this study, the physical environment seemed to support immigrants' participation, as 75% of the respondents saw the activities offered in their environment as sufficient for themselves and their families. This result differs from earlier studies, according to which a significant cause hindering social well-being were a lack of physical locations for e.g., meeting friends (Gupta and Sullivan 2013, Ho and Cheung 2011).

One of the main factors in integration is learning the new country's language (Castaneda and Kuusio 2019, Gupta and Sullivan 2013, Jönsson et al. 2012). Slightly fewer than 40% of the respondents in this study estimated their ability to speak Finnish as good or excellent and slightly above 40% estimated their ability to understand Finnish as good or excellent. The result can even be seen as bad, as the respondents had lived in Finland for 11 years on average. The result supports the OECD (2018) criticism of the Finnish education system's ability to teach Finnish to immigrants. Finland should create a national language program for immigrants, which would ensure the responsibilities of language training, an efficient execution and regular tests for learning and creating incentives for learning, such as increased social benefits or access to internships. There is a great deal of research showing that learning the new country's language advances integration, social well-being and health (Castaneda and Kuusio 2019, Gupta and Sullivan 2013). This study shows that those who were more confident in their Finnish skills participated more in activities than those who considered their Finnish lacking.

According to the factor analysis, the greatest hindrance to immigrants' participation in outside home activities were the rules of one's culture. This reinforces the findings of Walseth and Fasting (2004) on religious and cultural rules. However, unlike their data, our respondents did not directly discuss racism as a hindrance, though there were indications of it in their fear of not being accepted. Those who organize outside home activities should offer more varied opportunities that consider cultural and religious characteristics. In Gupta and Sullivan's (2013) study, women were particularly concerned with maintaining their own culture in the new country, which partially hindered their integration into the new country. It is understandable that it is easier to make and maintain friendships within one's own ethnic group and to make culturally approved decisions regarding e.g., leisure time (Avenarius 2012, Gupta and Sullivan 2013, Suto 2013.) However, this may also hinder integration as found by Kim et al. (2016). Other significant hindrances in this study were fears of insufficient language skills and experiences of personal inability, such as challenges related to computers.

Participation in outside home activities was hindered by a lack of money for half the respondents and a lack of time for a third of the respondents. Immigrants also mentioned a lack of money and time in earlier studies (Zacheus et al. 2011). Activities in Finland are expensive. High costs are particularly prohibitive for the unemployed, while the employed might be hindered by a lack of time. In Finland, as in other Western countries, everyday life is highly scheduled and busy. A lack of time can make it difficult to create and maintain friendships (Pajnik and Bajt 2012, Gupta and Sullivan 2013, Suto 2013), which led immigrant women in particular to consciously prioritize their own family. A lack of time can also be seen as a problem of perception, as immigrants may have a more fluid concept of time than Finns (Gupta and Sullivan 2013, Suto 2013), who are used to activities starting and ending at a specified time. Immigrants might be more comfortable with activities that allow them to participate when they have time. Zacheus et al. (2011) also found that women wanted to pursue physical activities in groups rather than alone. The need for accessible artistic workshops dedicated to pursuits such as painting and woodwork could be met by services developed by e.g., civic organizations.

The fear of not being accepted was a significant hindering factor, as 30% were sometimes afraid of it and another 30% were often or always afraid it. Some Finns have become increasingly opposed to immigrants over the past few years, largely as a result of the increased number of immigrants and a tightening economic situation in Finland. Work-based immigration is frequently seen as a positive, but there is also a great deal of political discourse regarding supposed 'standard of living refugees' who are not truly escaping oppression. This challenge should be met by each city through means such as networks that would assemble various actors and immigrant representatives to invent new and innovative forms of enabling Finns and immigrants to meet each other.

Approximately half of the respondents received support from their family for their outside home activities. Many (40%) also received support from Finnish friends and other immigrants. Support from neighbours was lesser, as clearly over half reported receiving no support from them. Earlier studies have found support from neighbours an important factor in integrating into the new country (e.g., Tsai et al. 2011). Approximately 60% received support from authorities in handling practical matters. From the perspective of integration, the number could be higher, as immigrants have a great deal of contact with authorities regarding matters such as employment and education. One might ask if the services provided to immigrants have been insufficient if so many feel unsupported by authorities. Earlier studies show that support from authorities is important in integrating into a new society (Gupta and Sullivan, 2013, Suto 2013). In this study respondents received more support from non-family members (34%) than their family and parents (23%), which shows that immigrants have developed their own support networks. This suggests a good level of integration.

According to Castaneda and Kuusio's (2019) study, social well-being consists, among other things, of good friends and satisfaction with interpersonal relationships. Many of the respondents expressed a wish to befriend someone from the majority population. The open answers mentioned the lack of social support as a factor hindering participation. The respondents had few social contacts with people from the majority population outside of work and education, as in previous studies (Avenarius 2012, Gupta and Sullivan 2013). Nine out of ten respondents had a hobby they enjoyed, such as walking, gym training, swimming or art appreciation, but only 34% belonged to a Finnish-speaking group or association. The results suggest that only a third has integrated into working with the majority population while two thirds pursue their hobbies either alone or with other immigrants. Participation in outside home activities has been found to be a significant factor in integration (Gerber et al. 2012, Jönsson et al. 2012, O'Driscoll et al. 2013).

The respondents expressed a desire for more community centres for both immigrants and Finns and immigrants. The idea of opening immigrant-only centres should be met with reservation, as they may increase an experience of otherness and further separate immigrants from the majority population (Kim et al. 2016, cf. Buchert 2015). Earlier studies (Gupta and Sullivan 2013, Pearce et al. 2017) show that immigrants work actively together with the majority population in religious activities, which also increases their sense of community and familiarity with the majority culture. Finland is not so much lacking in available and open community centres as participants. Such activities should try to activate both immigrants and people from the majority population. Many respondents wished they could befriend a Finn, which should be possible at such centres. The respondents also wished that Finns were more active in trying to form contacts with them.

Women, particularly those who were single parents, mentioned the lack of child-minders as a factor hindering their participation in activities outside the home. Earlier studies show that mothers often bear the main responsibility for their children (Khawaja and Milner 2012, Lenneis and Pfister 2017, Phan et al. 2015). The family dynamics in immigrants' cultures may be vastly different from those of the new country, in which fathers participate in caring for their children in a more egalitarian fashion.

Limitations of the Study

The study sought for immigrants in three cities, who were discovered at various community centres. Those present were likely active people with the energy, skills and desire to participate in activities outside the home. The respondents were already active people, which can be seen in their responses. The respondents came from various ethnic backgrounds, which means the data represents a heterogeneous group. As the sample size was also small, the results are thus approximate and cannot be generalized to all immigrants. This study was mainly concerned with the factors hindering and supporting immigrant participation in outside home activities, which has previously received little scientific attention.

The questionnaire was created for this study based on previous literature and research. The study's reliability was improved by pre-testing the questionnaire on four professionals with long experience in working with immigrants and immigrants who have lived in Finland for a long time. The questionnaire was amended somewhat after the pretesting. The questionnaire was translated by qualified professionals at the same agency, so it can be assumed that the questions retained their meaning in translation. It would however have been more reliable to double translate the questionnaires.

The analysis phase showed that content validity had been achieved, as the replies showed that the respondents had understood the questions as the researchers intended and no questionnaires had to be discarded for this reason. The reliability of the two statement sections was tested using Cronbach's alpha, which showed a high reliability ($\alpha = > 0.80$). The questionnaire can thus be said to be internally consistent (Polit and Beck 2014).

Factor analysis should offer a meaningful interpretation of the factors' contents, there should be as few factors as possible and they should explain the variables' covariation as much as possible. In the analysis of causes hindering participation, the first four factors explain more than 50% of the covariation. In the analysis of causes supporting participation, the first two factors explain more than 50% of the covariation. The factors formed by both analyses can be interpreted in a meaningful way.

The target group of the study, immigrants with a residence permit, are often people in a vulnerable position and difficult to reach through mailed questionnaires. The researchers visited their community centres in person, where they could directly answer questions about the study, the project and the uses of their replies, which increased their willingness to participate. Answering the questionnaire was based on self-evaluation, which carries the risk of the respondents answering in a socially accepted rather than the true way.

Despite the small sample size (n=113), the results can be seen as valuable, as there has been little research on immigrants' perspectives on outside home activities as part of integration.

Conclusion

There have been relatively few studies of immigrant participation in outside home activities in Finland. The results of this study strengthen earlier results about the advantages of participating in activities in learning the language and integrating into the culture and the environment.

To enable better integration, Finland should create a national language program that would ensure the responsibilities of language training, an efficient execution and regular tests for learning. From the perspective of immigrant employment and participation in society, learning the language is of utmost importance and should be prioritized for each immigrant.

Creating community centres and common activities for immigrants and the majority population would make the majority's attitudes towards immigrants more positive and enable friendships to form between immigrants and Finns. This would also improve the language skills of immigrants.

One hindering cause for immigrant participation in activities that was mentioned was the high cost of hobbies. Finland needs more social benefits that would support the activities of low-income immigrant families, particularly those with children.

Creating regional and citywide networks between organizations and immigrants to increase participation opportunities would advance new ideas and innovations.

Disseminating the results of this study among immigrants might motivate them to study Finnish more. The project will send copies of the article to immigrant community centres.

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Revisiting the Relationship between E-Government and Corruption: An Empirical Investigation

By Abdel Rahman Ahmed Abdel Rahman[*]

This study reinvestigates the relationship between e-government and corruption taking into account some potential methodological problems encountered in multivariate regression models based on the use of cross-country data. Contrary to the stylized fact that e-government reduces corruption, this study finds that e-government has this effect only in combination with gross domestic product per capita which is a very important factor that affects corruption. Moreover, unlike previous studies investigating this relationship, this study includes in its multivariate regression model economic freedom as an important factor affecting corruption. The key finding here is that economic freedom curbs corruption only at high levels of economic development. The interaction of e-government and wealth on the one hand and economic freedom and level of economic development on the other in curbing corruption suggests that there may be synergies associated with these factors in producing this effect on corruption.

Keywords: *e-government, economic freedom, corruption, collinearity, heteroskedasticity*

Introduction

Researchers continue to assess the impact of e-government not only on organizational or administrative values (e.g., efficiency, economy, effectiveness, service quality, etc.) and on political values (e.g., public accountability, citizen engagement, democracy, transparency in government procedures and processes, etc.), but also on the public bureaucracy itself. The potential for e-government to transform the public bureaucracy has prompted some to claim that information technology has engendered a paradigm shift in the practice of public administration, particularly at the municipal level of government (Chadwick and May 2003). Some have even claimed that a shift has occurred from the traditional bureaucratic paradigm to the e-government paradigm (Ho 2002).

In recent years, scholars have investigated the question as to whether e-government has any effect on corruption. The availability of cross-country or cross-national data on individuals' perceptions of corruption, economic freedom, e-government, democracy, rule of law, etc. has provided scholars with data instrumental in the empirical investigation of this research question. More often than not, researchers have used multiple regression models in their assessment of the impact of e-government on corruption. This kind of research methodology is

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fraught with potential methodological problems, particularly collinearity/ multicolinearity, heteroskedasticity, and endogeneity.

Previous studies investigating this research question do not usually pay attention to these problems, notwithstanding their potentially confounding effects on the results of testing their research hypotheses. Nonetheless, a consistent research finding of such studies is that e-government, together with other factors, curbs or reduces corruption in government. This study aims at investigating the effect of e-government on corruption, taking into account these methodological problems. In addition, it uses a regression model that improves on previously used models. Further, the study is based on a random sample, a requirement for regression analysis, which is rarely used in previous studies. The study is divided into four sections. The following section provides an account of the relevant conceptual and empirical literature on e-government, then follows the model of the study, and afterwards a discussion on data and methods. The final section presents data analysis results and conclusions.

Literature Review

The conceptual and empirical literature on e-government has been steadily growing in recent years. The works cited here are simply illustrative rather than being exhaustive. A few strands are discernable in this literature[1]. The strand that is quite relevant for the purpose of this study is the one which investigates the relationship between e-government and certain values which encompass, inter alia, governmental efficiency and effectiveness, public accountability, transparency in government, public service quality, integrity, democratic responsiveness, rule of law, and citizen participation and empowerment (Hazlett and Hill 2003, Holliday and Kwok 2004, Kossick 2002, Netchaeva 2002, West 2004, Wong and Welch 2004, Zhao and Xu 2015, Maerz 2016).

An important portion of this strand is a growing body of literature investigating the relationship between e-government and corruption in government. This strand can be seen as a subset of the much wider investigation into the causes of corruption. Numerous factors have been proposed as determinants of this phenomenon. Economic factors proposed include inflation, gross domestic product per capita, economic freedom, etc. (Paldam 2002, Graeff and Mehlkop 2003, Andersen 2009, Mistry and Jalal, 2012, Elbahnasawy and Revier 2012, Pieroni and d'Agostino 2013, Zhao and Xu 2015). Political factors identified as influencing corruption in government include e-government, size of the public sector, democracy, government regulation, rule of law, law enforcement; political stability, government effectiveness, etc. (Tanzi 1998, Paldam 2002, Kim 2014).

In view of the multitude of factors that may affect corruption and may be affected by it, assertions have begun to emerge underscoring the difficulty in investigating the causes of corruption. A social behavior, corruption may be subject to numerous influences. In its own right, however, it may influence both individual behavior and social institutions. For researchers trying to explain it, this

[1]For a full discussion on these strands, see Nour et al. (2008).

means that their explanatory factors may be influenced by the very same phenomenon that they try to account for. This is well reflected in Treisman's (2007, p. 437) statement that

> Corruption is hard to study empirically. Its many likely determinants interrelate in complicated ways. Some can change quickly and may be caused by corruption as well as the reverse. As with other types of criminal activity, it is hard to observe directly, and so researchers must rely on surveys of corruption's victims, the accuracy of which is often difficult to assess.

In a similar vein, this view is echoed by the IMF perspective on the relationship between corruption and a number of economic variables (e.g., government spending, taxation, economic growth, etc.) that are usually hypothesized as affecting corruption. According to this perspective, corruption affects these variables through its effect on public finance (Hillman 2004).

With respect to the relationship between corruption and e-government, corruption may not only impede the adoption of e-government, it is argued, but may also bring about the failure of e-government projects once they start (Heeks 2003, Aladwani 2016). In a similar vein, Heeks (1999, p. 188) notes that:

> Corruption is a phenomenon rooted in the cultural, political, and economic circumstances of those involved. IT does little to affect these root causes, remains limited in its surveillance potential, and so cannot eliminate corruption.

Notwithstanding the inherent difficulty in studying the causes of corruption, a stylized fact[2] or an empirical generalization has emerged from studies assessing the effect of e-government on corruption. This stylized fact is that e-government reduces or curbs corruption. Yet, studies arriving at this conclusion rarely, if ever, take into account some methodological problems that may confound the results of their studies. These problems arise from the use of aggregate cross-sectional data employed in cross-country studies of the causes of corruption.

One such problem is heteroskedasticity in multivariate regression analysis. This problem makes T-tests and, by implication, hypothesis tests unreliable. Another methodological problem encountered in cross-country studies using multivariate regression analysis is collinearity/multicollinearity. This problem represents a violation of the regression assumption that regressors or independent variables are not correlated. Collinearity of two regressors or multicollinearity of more than two regressors inflate the standard errors of regression coefficients, thereby increasing the probability of rendering those co-efficients statistically insignificant and thus of accepting null hypotheses. Notwithstanding the availability of methods to deal with this problem, previous studies rarely, if ever, employ them.

Both of these problems are important inasmuch as they may lead to erroneous causal inferences. In particular, collinearity may lead to model misspecification and hence the attribution of erroneous causation (Winship and Western 2016).

[2]On stylized facts, see Hirschman (2016).

This study detects and corrects for both of these problems. In dealing with heteroskedasticity, it uses bootstrapping, which is embedded in recent versions of SPSS-PC, for regression co-efficiencts. This method generates heteroskedastic-robust standard errors for regression co-efficients (Flachaire 2005).

Methods and Data

The Empirical Model

A multivariate regression model, based on Ordinary Least Squares, is used here to see if e-government has any effect on corruption, the dependent variable. In view of the numerous factors that affect corruption, any model that aims at explaining corruption has to control for those factors.

The Unit of analysis is country; cross-country aggregate data will be used to assess the effect of e-government on corruption. Unlike previous studies, this study uses a random sample of countries with a view to guarding against sample selection bias. A random process, embedded in SPSS-PC, is used to generate a random sample of 100 countries out of 194 countries which are members of the United Nations Organization. The study estimates the following model:

CORR= $B_1 - B_2$ EGD – B_3 ECON.FREE – B_4 GDP.PC + B_5POL.INST +B_6 INFL
Where
CORR= Corruption
EG= E-Government
ECON.FREE= Economic Freedom
GDP.PC= Gross Domestic Product Per capita
POL.INST= Political Instability
INFL=Inflation

Dependent Variable

The cross-country measure of corruption that has been used extensively by researchers is the Corruption Perceptions Index (CPI) published annually by Transparency International in Germany. The index does not measure actual experience with corruption; it simply records the opinions or perceptions of individuals about corruption in a country. Another problem with this measure is that it may embody the individualistic or reductionist fallacy[3] in that it makes inferences about countries based on evidence (i.e., individuals' perceptions) gathered from individuals. Notwithstanding these problems, CPI remains the most widely used cross-country measure of corruption. This study uses the 2014 CPI.

Although the CPI is designed to measure a country's level of corruption, a country's score on the index actually reflects how corruption-clean that country is. The index gives each country surveyed a value or score between 0 and 100. In other words, a high score (e.g., 98) indicates very low level of corruption.

[3]On the concept of individualistic fallacy see Nachmias and Nachmias (2000).

Conversely, a low score (e.g., 10) indicates a high level of corruption. For consistency and interpretation of data analysis results, this study transforms the scores for the sample of countries so that high scores indicate high levels of corruption and low scores reflect low levels of corruption. This transformation is achieved by subtracting each country's score from 100. Thus, the 2014 CPI's scores for Denmark and South Sudan are 92 and 15, respectively. After transformation, the scores for Denmark and South Sudan are, respectively, 8 and 85.

<u>Independent Variables</u>

E-government

This is the key explanatory variable of the study. Information on e-government is published by the United Nations in its annual E-Government Development Index (EGDI), which gives each one of its member countries a value that ranges between 0 and 1 inclusive. This index is a composite of three indexes: Online Services Index (OSI), Information and Telecommunications Index, and Human Capital Index. Each one of these indexes also gives each member country a value that ranges between 0 and 1 inclusive.

The study uses the overall E-Government Development Index (EGDI) as a measure of e-government; it is the overall state of e-government development that is expected to curb corruption. It is crucial for the purpose of this study that EDGI encompasses OSI, which is a measure of the extent to which governments provides services and information through their portals. The use of those portals by members of the public does not require any physical interaction with public officials, thereby precluding opportunities for corrupt acts (e.g., taking bribes and kickbacks). Thus, it can be hypothesized that the more developed and extensive a country's e-government is, the less will be opportunities for corruption and the less will be corruption itself. This is related to the rent-seeking hypothesis which, in the context of government regulation, posits that discretionary authority provides public officials with the opportunity to solicit or extract rents (i.e., bribes/ kickbacks) in exchange for desired government services.

Economic freedom

This is an important control factor in the study's empirical model. In general, previous research has demonstrated that, given the level of economic development and wealth, economic freedom curbs corruption (Chafuen and Guzman 2000, Paldam 2002, Graeff and Mehlkop 2003, Pieroni and d'Agostino 2013). This is related to the aforementioned rent-seeking hypothesis in that economic freedom deprives officials of the opportunity to engage in rent seeking.

Surprisingly enough, this important control variable rarely appears, if ever, in multivariate regression models investigating the effect of e-government on corruption. The exclusion of this important variable from such models may lead to model misspecification and, concomitantly, erroneous inferences as to the real causes of corruption. A multi-dimensional phenomenon, economic freedom encompasses components that preclude opportunities for corrupt practices. In general, this is the case with those corrupt practices that arise from the physical interface between those who seek public services and public officials who deliver those services. A case in point is bribes and kickbacks. A key economic freedom component which obviates the need for such interface is deregulation. The implication here is that economic freedom is a pivotal control variable that cannot be excluded from a model seeking to investigate the effect of e-government on corruption.

Cross-country measures of economic freedom are, as to be expected, multi-national in nature. They usually encompass, inter alia, freedom from corruption, property rights, fiscal freedom, financial freedom, investment freedom, trade freedom, labor freedom, government spending, etc. In this study, economic freedom, conceived as freedom to engage in productive economic activities, is used. Methodologically, this study uses an overall single measure of economic freedom rather than multiple measures of its various components. In previous research, various components of economic freedom were incorporated into single regression models. This is likely to cause the multicollinearity problem, as those components are likely to correlate with each other.

This study uses the 2014 Heritage Foundation Index of Economic Freedom. This index provides a measure of the extent to which economic agents (i.e., individuals and businesses) are free to engage in economic activities. The Foundation's measure of economic freedom combines measures of 10 dimensions: property rights, government spending, fiscal freedom, business freedom, trade freedom, financial freedom, investment freedom, trade freedom, freedom from corruption, and labor freedom. For each one of the more than 180 countries listed, the Foundation provides a score for each one of the 10 dimensions of its measure of economic freedom. In addition, the Foundation's Index of Economic Freedom provides an overall score of economic freedom for each one of those countries. This overall score is simply the average of the 10 scores of all 10 dimensions.

As previously noted, this study uses a single measure of overall economic freedom seen as freedom from government to engage in economic activities. The study excludes freedom from corruption from this measure to avoid endogeneity which will arise if corruption, the dependent variable, is also included in the model as an independent/explanatory variable. In excluding the score for corruption, an average overall score for each country in the sample is obtained by summing all scores for the remaining 9 dimensions and dividing by 9.

Inflation

In the literature (Paldam 2002), inflation is used as a proxy for economic chaos. The so-called chaos or demoralization hypothesis posits that economic chaos has a corrosive effect on public morale and trust in authorities. Corruption was found to have a strong negative correlation with trust in government (Paldam and Svendsen 2000). Therefore, it is hypothesized that the greater the economic chaos or the higher inflation is, the higher will be the level of corruption.

Regardless of being a proxy for economic chaos or not, inflation in its own right may lead public officials to engage in corruption. High inflation reduces real incomes if nominal incomes (e.g., salaries of public officials) do not increase as inflation increases. Faced with diminishing real incomes during high inflation, public officials may resort to corrupt practices to supplement their incomes. Thus, it can be hypothesized that the higher the inflation rate, the higher is the level of corruption.

Level of a country's wealth

This is an important control variable, as study after study (Treisman 2007, Paldam 2002, Graeff and Mehlkop 2003, Andersen 2009, Saha and Gounder 2013) has found that it reduces corruption, when measured as gross domestic product per capita. Wealthy countries are more likely to have the infrastructural requirements for e-government. Thus, a country's wealth is expected to positively affect the likelihood of adopting Web-enabled transactions for public services (Abdel Rahman 2014). In other words, the wealthier a country is, the more likely that it will have developed e-government. In addition, members of the public in countries with high per capita incomes are likely to have greater access to computers and the Internet than those in countries with low per capita incomes. Accordingly, this predictor is likely to correlate with e-government, and may thereby cause the collinearity problem which may be serious.

For this study, the 2014 gross domestic product per capita at purchasing power parity (PPP) is used to measure a country's level of wealth. The natural logarithm is applied to the values for this variable with a view to guarding against heteroskedasticity problem which is usually expected to be present in cross-national income data. To further guard against this problem, bootstrapping of regression coefficients is used, as previously noted, to produce heteroskedastic-robust standard errors for regression co-efficients.

Political instability

Political Instability appears frequently in the empirical literature as a factor leading to corruption (Treisman 2007, Hillman 2004, Shim and Eom 2008, Pellegrini and Gerlagh 2008). Underpinning the relationship between political instability and corruption is the argument that the former creates conditions of lawlessness that is conducive to corruption. However, the reverse argument has also been made; corruption may also cause political instability (Treisman 2007, Elbahnasawy 2014).This causal relationship appears to be buttressed by a 2015 study on peace and corruption conducted by the Institute of Economics and Peace. The study concludes that increases in police and judicial corruption directly undermine the rule of law, thereby increasing domestic violence and conflict (Institute of Peace and Economics 2015, p. 2). However, limiting corruption in government to only two state institutions (i.e., the judicial system and police) may not capture the full extent of corruption in a country, including those aspects of corruption that may be affected by political instability. For instance, one study has found that political instability motivate officials to embezzle public funds (Campante et al. 2008). Moreover and rather ironically, the study of the Institute of Economics and Peace has found that out of 16 indicators of domestic peace/ violence, political instability is the only indicator that has a statistically significant effect on corruption, though at 0.1 level of significance.

For purpose of this study, whether political instability affects corruption is ultimately an empirical question that needs to be investigated. Data on political instability is obtained from the 2015 Global Peace Index published by the Institute for Economics and Peace. The 2015 Index assigns a score and a rank for each of its list of 162 countries.

Regression Results: Model 1

Table 1 present OLS regression results. As can be gleaned from the table, the model explains more than 70% of the variation on corruption, the R-squared being 0.73. The regression coefficient for EG is in the right direction and statistically significant at 0.01 level of significance. However, it is obvious that there is a severe collinearity problem, as EG correlates strongly with GDP.PC, the correlation co-efficient being 0.87. Moreover, the coefficient for GDP.PC is neither in the right direction nor being statistically significant, probably reflecting the effect of the collinearity problem. The presence of this problem is also confirmed by the variance inflation factor (Table 2) being more than 4 and tolerance value being less than 0.40, the two cutoff threshold values generally accepted in the literature (Carney and Surles 2002).

Table 1. *Regression Results: Model 1*

Independent Variables	Co-efficients			T-Ratio	Significance
	B	Std. Error	Beta		
(Constant)	47.975	22.452		2.137	0.036
INFL	0.123	0.163	0.051	0.755	0.453
ECON.FREE	-0.153	0.193	-0.068	-0.794	0.430
POL.INST	14.611	2.983	0.370	4.898	0.000
EG	-51.287	12.944	-0.615	-3.962	0.000
GDP.PC	1.246	2.355	0.075	0.529	0.598

$R^2 = 0.73$.

Table 2. *Collinearity Statistics*

Independent Variables	Tolerance	Variance Inflation Factor (VIF)
Constant		
INFL	0.784	1.275
ECON.FREE	0.498	2.010
POL.INST	0.641	1.559
EG	0.151	6.602
GDP.PC	0.181	5.520

As shown in Table 1, the estimated standard error of the co-efficient for GDP.PC is relatively large, the result of which is to render this co-efficient not statistically significant. Three ways have been suggested to deal with serious collinearity problem (O’Brien 2007): omitting one of the collinear regressors, using ridge regression, or combining the two collinear regressors into a single index. Ridge regression is ruled out here; it is a biased regression technique (O’Brien 2007).

By the same token, omitting GDP per capita or EG is not followed here because both regressors are important in the model. It makes a lot of sense to combine these two factors in a single index. Combining these two variables into a single index variable is substantively justifiable. Beyond the strong statistical correlation between the two variables, there is, arguably, a substantive relationship between these two factors, particularly in the context of developing countries where individuals with relatively high incomes tend to live in urban areas with greater access to the internet and e-government facilities. It has also been found that countries with high per capita income are more likely to adopt e-government (Abdel Rahman 2014).

Table 1 also shows that the co-efficient for ECON.FREE is in the right direction, albeit it is not statistically significant. In other words, it tends to reduce corruption, though this effect is not statistically significant. This is consistent with previous research (Graeff and Mehlkop 2003). However, when level of economic development is taken into account, economic freedom is shown to have a statistically significant effect on corruption (Graeff and Mehlkop 2003). This method is adopted here in the regression model below.

The regression co-efficient for INFL is also in the right direction, although it is not statistically significant. The level of statistical significance for this co-efficient, as well as those for the other variables, remains unchanged with the bootstrapping of those co-efficients with a view to producing heteroskedastic-robut standard errors for the co-efficients (Table 3).

Table 3. *Bootstrap for Co-Efficients*[*]

Independent Variables	B	Std. Error	Significance
(Constant)	47.975	21.547	0.021
INFL	0.123	.243	0.485
ECON.FREE	-0.153	.182	0.361
POL.INST	14.611	3.456	0.001
EG	-51.287	14.525	0.002
GDP.PC	1.246	2.559	0.626

[*]Bootstrap results are based on 1000 bootstrap samples.

Regardless of the bootstrapping results, a modified model is needed that takes into account the problems with the current model. The following equation presents this modified model (Model 2):

CORR= $B_1 - B_2$ EG.GDP – B_3 ECON.FREE – B_4 ECONFREE.ECONDEV + B_5
POL.INST +B_6 INFL
Where
CORR= Corruption
EG.GDP= A combined variable of e-government and GDP
ECONFREE.ECONDEV= an Interaction variable of economic freedom and economic development

POL.INST= Political Instability
INFL=Inflation

This new model combines EG and GDP into one variable (i.e., EG.GDP) which is, as previously noted, an index-based variable. The following steps are used in the construction of this index: First, data on GDP per capita for the sample of the study is transformed into an index. This transformation is necessary because GDP per capita and e-government are measured in different units; GDP per capita is measured in dollars whereas e-government has index values. Transforming GDP per capita data into an index standardizes it into the same measurement unit as EG. To achieve this transformation, an average GDP per capita value of all GDP per capita values in the sample is obtained. A GDP per capita index is obtained by scaling down (i.e., dividing) each country's GDP per capita by the average GDP per capita. As should be expected, countries with GDP per capita higher than the average GDP per capita score more than 1 on the GDP per capita index whereas countries with a GDP per capita lower than the average have a value between 0 and 1 on the index. For example, the 2014 GDP per capita (PPP) for the United States and South Africa, which are both in the sample, was US$ 54597 and US$ 13046, respectively. When both of these values are divided by the GDP per capita average of US$ 15561, the United States South Africa score, respectively, 3.5 and 0.84 on the GDP per capita index (Table 4).

The second step in combing EG and GDP per capita is to assign weights to each in the combined index variable. An equal weight of 0.5 is assigned to each one of these variables, the assumption here being that there is no rationale, based either on theory or observation, for assigning differential weights. Finally, an EG.GDP index value for each country in the sample is obtained by summing the values on the EG index and the GDP index for each country and dividing by 2. These two steps are illustrated in Table 4 which demonstrates the sequential construction of the EG.GDP index for 9 selected countries from the sample.

Table 4. *Construction of EG. GDP Index for Selected Countries*

Country	GDP Per Capita (US$)*	Average GDP Per Capita (US$)**	GDP Per Capita Index (2/3)	EG Index	EG.GDP Index (4+5)/2
United States	54597	15561.5	3.51	0.8748	2.19
South Africa	13046	15561.5	0.84	0.4869	0.66
Austria	46420	15561.5	2.98	0.7949	1.89
Brazil	16096	15561.5	1.03	0.6008	0.82
Egypt	10877	15561.5	0.70	0.5129	0.61
Ghana	4129	15561.5	0.27	0.3735	0.32
Iceland	43637	15561.5	2.80	0.7970	1.80
India	5855	15561.5	0.38	0.3834	0.38
Nigeria	6031	15561.5	0.39	0.2929	0.34

*2014 GDP Per Capita figures at Purchasing Power Parity.
**Figure represents the average GDP per capita for all 100 countries in the sample.

Model 2 also includes an interaction term for economic freedom and economic development. This interaction is represented by ECONFREE.ECONDEV. Economic development is a dummy variable which takes the value 1 for OECD countries and 0 otherwise. Interaction here is achieved by multiplying the values for economic freedom by those for economic development. In the model, the interaction variable tests the hypothesis that economic freedom in OECD countries has a non-zero effect on corruption. The remaining variable in this new model are the same as those in Model 1.

Regression Results: Model 2

As Table 5 shows, the new model has greater explanatory power compared to the original model. It accounts for nearly 80 percent of the variation on corruption, the R^2 being 0.79 compared to a R^2 value of 0.73 in the original model. Moreover, the serious collinearity problem associated with Model 1 is not encountered in Model 2. However, there is still some measure of collinearity in the latter model, particularly involving ECONFREE.ECONDEV and EG.GDP. However, as shown in Table 6, the VIFs for these two collinear predictors are well below the cutoff threshold value of 4 which is generally accepted in the literature as indicative of acceptable collinearity.

Table 5. *Regression Results: Model 2*

Independent Variables	B	Std. Error	Beta	T-Ratio	Significance
(Constant)	58.836	12.474		4.717	0.000
INFL	0.048	0.144	0.020	0.332	0.741
ECONFREE	-0.219	0.164	-0.097	-1.330	0.188
POL.INST	11.332	2.746	0.287	4.126	0.000
EG.GDP	-12.016	3.129	-0.357	-3.840	0.000
ECONFREE.ECONDEV	-.220	0.068	-0.305	-3.250	0.002

$R^2 = 0.79$

Table 6. *Collinearity Statistics*

Independent Variables	Tolerance	VIF
Constant		
INFL	0.791	1.264
ECONFREE	0.539	1.854
POL.INST	0.597	1.676
EG.GDP	0.333	3.007
ECONFREE.ECONDEV	0.327	3.055

The co-efficient for EG.GDP is in the right direction and statistically significant at 0.01. The negative sign of the co-efficient indicates that the combination of a country's wealth and e-government development reduces corruption. Moreover, the beta for EG.GDP has the largest value among all beta values in the model. This implies that this variable is the most important variable in the model accounting for corruption.

The co-efficient for the interaction of economic freedom and economic development is also in the right direction and statistically significant at 0.01. As previously noted, this is consistent with previous research findings which suggest that economic freedom curbs corruption in countries that have achieved a high level of economic development. The co-efficient for ECONFREE is, as expected, in the right direction, but it is not statistically significant. As previously noted, this is also in line with previous research which suggests that economic freedom alone has no systematic effect on corruption. The relatively large size of the beta co-efficient value (-0.30) for ECONFREE.ECONDEV is second only to the one for EG.GDP, indicating that this variable is the second most important variable accounting for reducing corruption in the model.

As is the case in Model 1, POL.INST has a systematic effect on corruption; its co-efficient is statistically significant at 0.01. It is also in the right direction; political instability increases corruption. By the same token, Domestic inflation tends to increase corruption. However, this effect is random, as its coefficient is not statistically significant at the 0.01 or 0.05 conventional statistical significance levels.

The bootstrap for regression co-efficients in Table 7 displays heteroskedastic-consistent co-efficients for all predictors in Model 2. All co-efficients retain their statistical significance levels shown in Table 5 which displays regression results without bootstrap for regression co-efficients. The bootstrap results suggest heteroskedastic-robust standard errors for regression co-efficients, implying reliable T-tests and statistical inference.

Table 7. *Bootstrap for Co-efficients*[*]

Independent Variables	B	Bias	Std. Error	Significance
Constant	58.836	0.183	10.984	0.001
INFL	0.048	-0.063	0.187	0.677
ECONFREE	-.219	-0.003	0.134	0.087
POL.INST	11.332	0.224	2.738	0.001
EG.GDP	-12.016	-0.542	3.197	0.002
ECONFREE.ECONDEV	-0.220	0.011	0.077	0.006

[*]Bootstrap results are based on 1000 bootstrap samples.

This study reaches the same conclusion drawn by several previous empirical studies investigating the effect of a number of factors on corruption. E-government is but one of several factors that have been reported to affect corruption. However, this study differs in one fundamental respect from other studies which is that e-government curbs corruption only in combination with a country's wealth. The level of e-government development correlates strongly with a country's gross domestic product which is a measure of a country's level of wealth. Substantively, this makes a lot of sense inasmuch as the higher a country's wealth is, the more developed its e-government is expected to be.

The close association of e-government development and growth domestic product makes it very hard to ferret out the true independent effect of e-government on corruption. In view of the cross-national nature of the data used in multiple regression analysis to investigate the effect of e-government and other factors on corruption, the collinearity problem may be unavoidable. In this study, this problem is quite serious on account of the very strong correlation between e-government development and gross domestic product. In dealing with this problem, the study has combined these two variables into a single index variable. Simple though it may be, this combination is an accepted way of dealing with serious collinearity. Empirical studies using multiple regression models to investigate the relationship between e-government and corruption rarely report, much less deal with, collinearity or multicollinearity which may be found in those models. Nonetheless, the unqualified conclusion of those studies is usually that e-government reduces corruption. Such a conclusion may be unjustifiable if e-government is strongly collinear with other factors. Simply put, establishing a causal relationship between e-government and corruption requires tackling collinearity if it is serious, as it has a potentially confounding effect on establishing internal validity or causality.

Conclusions

This study has empirically demonstrated that e-government, in combination with a country's wealth, reduces or curbs corruption. However, e-government is not the only factor having this effect. To be sure, other factors, particularly economic freedom interacting with the level of economic development, also have this salutary effect. Nevertheless, e-government, in its own right, appears to be at least responsible for some of this effect insofar as it eliminates the physical interaction between economic agents (i.e., individuals and business firms) and public officials. The absence of such an interface forestalls any opportunities for a key component of corruption; namely, bribes and kickbacks.

This salutary effect is the function of transactional e-government or online provision of government services which does not require any physical interface between members of the public and public officials. The policy implication of this effect is fairly obvious; an anti-corruption strategy should embrace a strengthened role for e-government. More specifically, the scope of online services should be widened to include more services. At present, online services are mainly provided for such things as application for car registration, driver licenses, filing tax forms, business licenses, etc. Widening C2G and B2G to incorporate a wider range of web-enabled government services could contribute to promoting efficiency, effectiveness, and responsiveness in government service provision.

An expanded scope for online government services could be a catalyst for expanding the scope of economic freedom. A wider range of online services could provide the impetus for some measure of deregulation which is a key component of economic freedom. E-government could be an effective conduit for good governance insofar as it contributes to curbing corruption in government and facilitating economic freedom which also has the effect of curbing corruption. In other words, e-government could promote good governance directly through reducing corruption and indirectly through facilitating economic freedom which, in turn, curbs corruption.

It is worth noting that providing services to people and businesses through e-government is only one facet in a multi-dimensional approach to curbing corruption. E-government could also provide access to information on government processes and procedures. This imparts transparency to government processes and procedures which, in turn, fosters open and accountable government. Such transparency can be an antidote to corruption, which finds a breeding ground in government processes conducted in secrecy. In other words, e-government should operate in the context of democratic governance which, as Jovanova (2021) points out, requires authentic participation, transparency, and responsibility at all levels of the government.

In passing, it is worth noting that while e-government is a contemporary means of curbing corruption in government, other means were used several centuries ago to tackle government corruption. Thus, in his perceptive discussion on the five ancient criteria of democracy, Papanikos (2022) describes how the process of appointment to public office was used in ancient Athens to protect citizens from corrupt judges. Needless to say, this method of curbing corruption is as relevant today as it was centuries ago.

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Visual Anthropology: A Systematic Representation of Ethnography

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In its development of one hundred years, anthropology evolved from travelogues of explorers to in-depth exploration of human from all possible angles. In its every venture, anthropologists were/are always in try to get closer to cultural affairs and dive deeper into human subjectivity. To achieve these purposes a series of theories and methods were developed, which served a lot, but with time it was also felt that readers idea of a research is anchored with and limited within the textual analysis written by the researcher. This dependency on the text was (and still) restricting the researcher to convey an actual image of the studied phenomenon, and also confining the readers from exploring their subjective self in finding meaning. The emergence of using visual aids in anthropology during the 90s opened a pathway for the researcher to make their researched visible to the audience. This visibility opens up many scopes of interpretation that are hitherto invisible. Though, researchers of other disciplines started the use of visual way before anthropologists. But its efficiency in transmitting meaning soon pulled the attention of anthropological social researchers. Since then, visual in anthropology has evolved in its use and presently one of the frontrunning methods in anthropological research. This article is systematically reviewing the history to present of visual anthropology with reference to theoretical development and practical use of the same.

Keywords: *visual anthropology, photograph, ethnography, movies, photovoice*

Introduction

"A picture is worth a thousand words" is a common phrase been used many times by many people, either genuinely or superficially, to make a statement about a specific moment. It will be not wrong to say that these "thousand words" are actually a thousand perceptions (or even more) that a picture can evoke in the minds of its observers. A picture is a framed memory and can transcend time and space. A picture can make us relive a moment that happened years ago and can transmit meaning flawlessly to a remote observer. For example, the famed painting of the Mona Lisa (Figure 1). Is she smiling? Is it the smile of happiness? Or, melancholy? This 16th-century painting by Da-Vinci is still keeping art historians, researchers and art experts in perplex. With innumerable research articles present, this painting is the epitome of the phrase "a picture is worth a thousand words" (Puchko 2015, Horstmann and Loth 2019). Whether Mona Lisa was an imaginative expression of Da-Vinci or it was an impression of an actual person (many scholars believe the painting depicts *Lisa Gherardini*, wife of the

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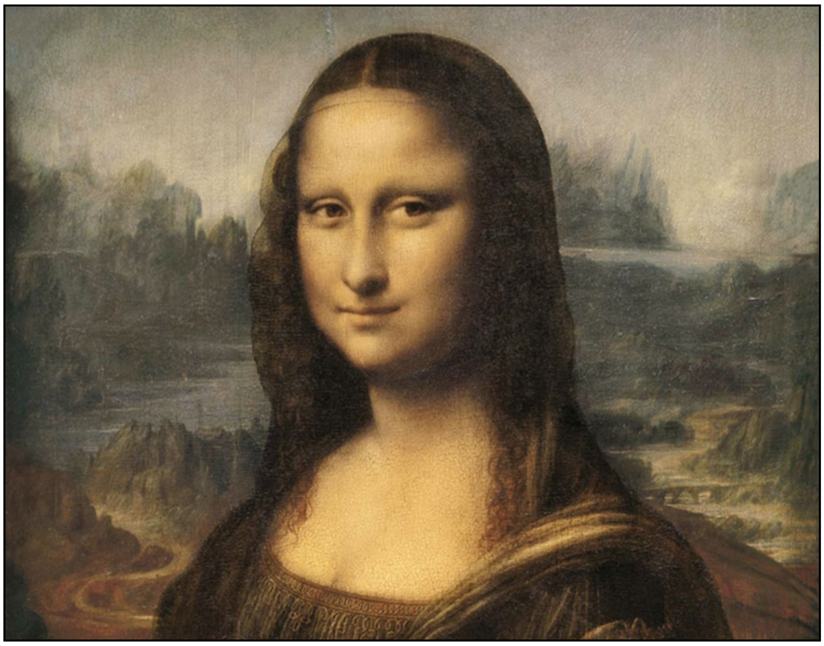
Florentine merchant *Francesco del Giocondo*) is still debated (Horstmann and Loth 2019), but it certainly testifies the potentiality of visual in evoking multidimensional subjectivity.

Figure 1. *Mona Lisa, by Leonardo Da Vinci. A Perfect Example of "A Picture is Worth a Thousand Words"*



Source: https://images.app.goo.gl/142QPZjn1UPYiSjv9, 2021.

These qualities of photographs/pictures soon grabbed the attention of explorers, travellers and researchers from various disciplines. In qualitative research, researchers often combine visual media and ethnographic research to provide a greater understanding of social phenomena. For many years, it has generally been evident that ethnographers who were experienced in fieldwork in a particular culture or society have used multiple media, including photographs, films, and sounds, to collect ethnographic materials. Though, the use of photographs in a meaningful way in anthropology is a much later development. With the start of fieldwork tradition, the discipline chiefly relies upon its qualitative and quantitative methods for enquiry. It is also true that most of its early theoretical development happened when the camera was just another item to carry in the field, and visual is not a method. But soon, researchers and their audience realized that enormous text is not enough to answer the question of visibility. The first documented anthropological use of the film was by Haddon (1898) during an expedition in Torres Straits Islands, including the latest scientific recording devices for taking still photographs, movies, and even experimental colour photographs (Long and Laughren 1993, Griffiths 2002). Even not only Haddon of that time, Franz Boas also used both film and photography during his early work among Kwakiutl Indians (Jacknis 1984) but could not promote any scientific appreciation for the value of photography. Later, Malinowski, an active fieldwork photographer whose more than a thousand photographs were archived at the London School of Economics (Young 1998) advocated in favour of visual methodology in the course of ethnographic fieldwork. The prefix "visual" is added to the chiefly "written" ethnographic discipline anthropology when the anthropological enquiries and representations start adopting visual techniques. This paradigm shift occurred in the late 90s and mainly took place in research methodology and presentation (Schwartz 1989). But why do we need a camera in the field when we already have stereoscopic eyes and a voluminous memory to see, understand, analyze, interpret and remember? To answer this question, we need to look back into earlier days of written ethnography, its shortcomings and also to look at some biological and psychological facts associated with our cognition that makes visual a more formidable option.

The Incompleteness of Ethnographic Writings and Rise of the Need for Visual Documentation

The beginning of anthropological writing was started by scholars who were essentially not ethnographers or fieldworkers. Popularly known as "armchair" anthropologists, these scholars collected data from missionaries, colonialist administrators, businessmen, travellers and writers from a distance, that is, there was an era in this discipline when the "subjects" and their cultural setting was not even visible to its researcher. The first step out in the field was taken by L.H. Morgan in his study on Iroquois before 1851, which was followed by Franz Boas in Baffin Land (1883-84) field trip (Srinivas 1959). The beginning of fieldwork tradition makes people and their culture visible and audible to anthropologists, but it only solved the problem of visibility partially, the audience or reader of anthropological texts were still deprived of visual clues about the culture or people they are reading about (MacDougall 1997). Again the "text only" description of culture lacks the ability to produce a visual projection of information, thus restricting the reader to experience the time and space of a described phenomenon embedded in a society and culture (Edwards 2002). This problem was encountered with a less effective solution to bring "exotic or native" people to museums, academic lectures and public displays, as practised by Kroeber and Franz Boas (MacDougall 1997), but still, their presence was just a bodily appearance without their cultural behaviour. With this attempt, visibility was achieved, to some extent, but devoid of its meaning. From the beginning and in the following decades, anthropologists' "equipment" only consisted of a pen, notebook and set of questionnaires. They went to the field of dying cultures where only a few persons live or reported a fading tradition of war dance or hunting technique (Mead 1974) but only and only in the textual description. Anthropologists had to rely on the memory of informants and the memory of himself or herself while documenting and thereby writing. Margaret Mead (1974) expressed her angst regarding the "text only" approach of Anthropology in the following manner…….

> …. ethnographic enquiries came to depend upon words, and words and words, during the period that anthropology was maturing as a science. Relying on words, anthropology became a science of words, and those who relied on words have been very unwilling to let their pupil use new tools... (Mead 1974, p. 5)

The beginning of fieldwork tradition in anthropology and its long practice throughout the history of this discipline led to the development of a series of research methods, either qualitative or quantitative. Rigorously used in many landmark ventures of anthropology, these methods have their limitations, as Ormerod et al. (2004) pointed out quantitative as expensive and lacking the ability to explain the context, whereas qualitative falls victim to the subjective interpretation of reality, which can be numerous, hence not suitable for statistical use. Another difficulty is the modes of using these methods, like taking notes, voice recording or measurement, but sometimes difficult to do because of climate (Mead 1974) or any adverse situation in the field. And all these can only record words or numbers but not expressions, behaviour and actions. In comparison to these methods, photograph(y) has both qualitative understanding and quantitative recording qualities. It can capture material reality and record verbal statements. The photographic evidence can be arranged in many typological schemes (as archaeologists do with potteries) and converted into statistical designs (Collier and Collier 1967). Moreover, as Margaret Mead (1974) opined, "it can catch and preserve behaviours on the verge of extinction". Apart from its technical superiority, the visual or visual clue is more supportive of our cognitive organization than text (Joe et al. 2019). A number of researches in the field of psychology show that visual feeds have strikingly affected our brain functions (Cavanagh 2011, Joe et al. 2019, Shimojo 2001, University of California – Davis 2013).

Reasons for More Acceptance: Evolutionary, Biological and Psychological Perspective

Why do we need a camera? It is a very legitimate question since we have stereoscopic vision, an informed mind and voluminous memory. But another rightful and challenging question was raised by John Collier Jr. and Collier M. (1967): how good observers we are? Challenging because observation is nothing less than a weapon for an anthropologist. But still, can we observe everything? Or, in another way, are we conscious about everything? This issue of consciousness was first addressed by Sigmund Freud, who proposed the concept of "unconscious" with the other two, "conscious" and "pre-conscious" (Freud 1963). The unconscious is the innermost layer of our mind, it is unspoken, unexplored and perhaps unknown, but it subtly affects our conscious activities. This dialectics between conscious and unconscious runs always inside the mind of, whether, it may be the anthropologist or the subject. With the mind, this "unconscious" also exists in the outside world. We know many aspects of human behaviour, society and culture but every bit of our pre-known ideas gets challenged when we enter a new community. It is not that we are always unaware of the happening, at least theoretically, but its practical manifestation in a specific time and space amazes us. We cannot understand it until we see it. That unseen part is the "unconscious" to us. Decades later, during the 1930s, Benjamin (1931) refined the concept of the "unconscious" by Freud and added a major idea in it. The idea of "unseen", it is out there, perhaps we know it in a dormant way but we never see it. He termed this phenomenon as "optical unconscious" (Smith and Sliwinski 2017). This "optical unconscious" could be a great hurdle for anthropologists to understand facts in the field situation. An example of optical unconsciousness from a day in the field will be befitting here.

A conversation was going on with stone dressers of Kashmir and they were narrating the damages caused to their business during the flood of 2013. They appealed to the state authority for compensation but were denied on the ground that they were dealing with stones, authorities concluded, and stone cannot be harmed by water. At that time, researchers found authorities correct because what possible harm could be caused to stone by water? They asked the same question to the stone dresser and, in reply get some photographs of devastated stone workshops. These photographs (Figures 2 and 3) were taken by the stone dressers themselves after the devastating flood ripped off their workshops and damaged their products and tools. Even the concerned authority and researchers had no idea of what a flood could do to stones, but these photographs give testimony in favour of stone dressers and prove their claim as rightful. And the loss was financial because they had to purchase all the raw materials again and have to pay the labours twice for the same job. That is why they needed the compensation. Researchers there are known to about the stone craft business, but the tits and bits of the trade are "unconscious" to them. Such incidents always happen in a field situation, and our unaided eyes fail to grasp it because it may be too small, too quick, and too subtle or not happening at that time. Here situates the importance of a camera and study of photographs (Mitra and Chakraborty 2019).

Figures 2 and 3. *Photographs of Disaster Taken by Stone Dressers*

Source: Mitra and Chakraborty 2019.

Another trouble arose when we were out in the field and floated by the fragmented nature of phenomena and ended up only dealing with some parts or fragments of it (Collier and Collier 1967). This process has some limitations, such as erroneous understanding of what the researcher is asking about by the respondent and difficulties from the end of the researcher to make the participant understand because of the language barrier. Practically, certain inquiries can hardly be researched verbally and explained textually because they cannot be explained perfectly by a verbal explanation of the informant. It is even tough for the reader to visualize it from a text-only narration written by social media scientists. Visual stimulation is a better way out, captured a priori the discussion with the informant, which may yield answers to questions that the anthropologist would not have asked or planned to ask. Apart from that, certain issues are largely impossible to communicate through texts, such as movement, position, posture (Thurnherr 2012), consciousness, cognition, sensory experience etc. (Taylor 1998). In these cases, the use of visual clues during and post-research is the key for better understanding and transmitting information, allowing the reader to de-anchor and explore the sea of subjective interpretation.

Most importantly, from its inception to today, visual evolved as people's medium, unlike text, in terms of mass acceptance, producers and audience. It crossed the boundaries of elite, educated, wealthy and every other kind of sophistication and developed as a household item for almost every stratum of society (Nuska 2019). Almost every household has a family photo album which is chromatographically sequenced family history and a unit level representation of society. With modern innovations in visual media in different shapes, such as small cheap digital cameras, smartphones, and computers, visual reaches everyone (Dewan 2015). The advent of social media platforms pushed visual a step forward. It becomes a representative "avatar" of every person who uses visual media. Undoubtedly, the count of such people is way higher than text consumers.

Some biological factors prove the use of visuals in research as advantageous. The relationship between human cognition and pictures has been observed since the prehistoric era. Even before the advent of language and writing, human have expressed their ideas in pictures, it is evident from the wall paintings made by our prehistoric ancestors. In due course of history, the images on the wall slowly evolved into pictographs, petrograms, petroglyphs and ideograms. But does a picture or visual clue has some close association with our memory and perception? Well, studies showed it has. Pictures and words express similar semantic codes, but pictures are more memorable because it has more distinctive visual features (Nelson 1979, Hockley 2008). For example, the textual definition of "Apple" tells us about a fruit that is red and has depression at two poles. There may be fruits of similar description also. But a picture of an apple gives us a clear view of the shape and colour, and at the same time, it can act as a proper identification tool. Nelson (1979) explained this phenomenon in his sensory-semantic model. Harper (2002) opined that the part of the brain which processes visual information is evolutionarily older than the parts that process verbal clues, and only the use of verbal clues led to less use of brains activity, in contrast, to the use of verbal-visual clues. Dewan (2015) also stresses that pictures are easier to recognize and process and easier to recall. Words create our memory with a single code, that is verbal, but photographs do so with double code, that is one visual and the other verbal.

Use of Photographs or Visual Aids in Social Sciences

But despite of its tremendous potentiality, the inclusion of visual as a subdiscipline or to develop as a methodology of anthropology was not smooth and even today, as Taylor (1998) opined a marginal approach. The ethnographic research was largely engrossed with verbal bias until World War I (de Brigrad 1975). Researchers and their commanding institutions negate the possibilities of the visual method by the logic of cost-effectiveness, lack of specialized skills for doing photographic research (Mead 1974) and not having the idea of what exactly to do with photographs (Collier and Collier 1967, MacDougall 1997). The postwar revolution in the academic sphere and technological advances facilitated the development of ethnographic visual presentation (de Brigard 1975). Though, visual or use of a camera in research was initiated by other disciplines and way before trained anthropologists adopted it. In 1902, photographer Edward Muybridge published an eleven-volume book with 20000 photographs consisting of movements of animal and human, which was followed by French physiologist Marey who did the same with animal, birds and insects' movements. The importance of Marey's work lies in his development of a camera that could photograph twelve frames per second, the predecessor of motion picture (Collier and Collier 1967). From the perspective of social research, the works of Felix-Louis Regnault can be regarded as the first use of films in ethnography. In collaboration with Marey's associate Charles Comte, a physician turned anthropologist, Regnault, filmed a Wolof woman making pots (1895) followed by climbing trees, squatting, walking by Wolof, Fulani and Diola people in a cross-cultural study fashion. Regnault also proposed the formation of an anthropological film archive (de Brigard 1975, Regnault 1931).

Cameras are not uncommon in Anthropological field trips since they became portable and carriable but rarely used as a technique under methodological guidance. The first photographs or films were simply travelling pieces, captured images of places and events with no real involvement (Preloran 1974), and/or a confirmation or proof of physical appearance of certain things or sample of reality (Collier and Collier 1967). These early attempts fell short in the potential use of visual technique but can be termed as antecedents and early attempts of using visual in the social sciences. The restricted scope for perception in those images was criticized by scholars (Collier and Collier 1967, Wright 1991, MacDougall 1997) and raised questions regarding the theoretical framework and methodological application of visual media. In brief, three questions are most important; first, how a camera can aid research? Second, what will be the type or kind of ethnographic/ anthropologically meaningful photography? And third, what will be the role of the researcher in the visual process? John Collier, Jr. (1967) explained the usefulness of the camera in the following manner……

> …cameras machinery allows us to see without fatigue, the exposure is just detailed as the first. The memory of the film replaces the notebook and issues complete notation under the most trying circumstances. The reliably repetitive use of a camera allows for comparable observation of an event as many times as the needs of research. It is one of the first steps in evidence refinement that turns raw circumstances into data that is manageable in research analysis…. (Collier and Collier 1967, p. 9)

Now, the question arises, what will be the kind or type of ethnographic/ anthropological photograph? A brief but satisfying answer was given by Elizabeth Edwards (1992, p. 13) is, "an anthropological photograph is any photograph from which an anthropologist could gain useful, meaningful visual information". Regarding the use of the visual method, Marcus Banks (1995) has suggested three major actions to follow, are – making visual representations by producing images of studied (and understudy) societies; examining pre-existing visual representations to gather information about the society; and collaborating with social actors in the production of visual representation. So, the camera (or photograph and film), in collaboration with the methodological framework, will act as an extension of researchers' observation, thus perception (Collier and Collier 1967). Dona Schwartz (1989) explained the triadic relationship between photographer, image and audience in visual ethnographic research. First, the researcher who takes the photograph, in that view the photograph entails the ideas of the researcher, which creates the second actor, the image itself. An image is an "unmediated and unbiased" as well as a free form of abstraction visual record. Lastly and most importantly, the third actor is the audience who construct the meaning of the photograph, which may be different from the other two. Roland Barthes (1964) described this phenomenon as "polysemic", which can be used (in different contexts) to express two or more different meanings. Visual is the "next level" method in social research, but is only visual media is adequate to comprehensively complete a research and can sensibly used to disseminate research data? From our understanding, it is not. Imagine a museum of prehistoric artefacts without mentioning their cultural stage and mode of use, or a photobook of traditional (of any culture) costume and accessories without mentioning their gender specification, ritualistic specialization and professional connection. Visual media without a verbal clue can only lead to two directions, either endless abstraction or imagination or hardly feasible to analyze. Visual media is not a cure for all problems in ethnographic research, rather a supplementary use of it with verbal information (or vice e versa), what Thurnherr (2012) suggested as "middle ground", will be a more effective research tool. Thurnherr's "middle ground" can be understood from Figure 4. The first impression of an observer about this picture will be a village ritual is going on, and persons in peculiar attire (in white cloaks and colourful headgear) are performing the ritual, while others in the photograph are observers. But this photograph also represents the hierarchical distance among villagers, which is not understandable or imaginable until explained in words. The persons performing the rituals and others who are closer to them belong to a higher caste. Whereas, persons sitting at a distance belong to a lower caste and are not allowed to get close to ritual performers.

After the development of the camera, several platforms adopted it and started using it in different ways. The "other" world became visible to us in the shape of news pictures, documentaries, melodramas, travelogues, advertisements and ethnographic films. (Gruber et al. 1959, Jacobs 1974, Hocking 2003). The ethnographic film has pulled the attention of social scientists and is still the most widely produced product of visual anthropology. Ethnographic films are not always produced by the anthropologist or even under the anthropological framework, for example, *Pather Panchali* (1955), directed by Satyajit Ray, is the most eloquent depiction of the rural Bengali lifestyle ever made. MacDougall (1981) opined that ethnographic film doesn't necessarily be made within the discipline of anthropology; rather, any film made to describe a culture is an ethnographic film. While Jay Ruby (1975) forwarded a differing idea and said that ethnographic films should be based on four anthropological criteria, defining the whole or portion of culture; theoretically informed; detailed methodology and use of anthropological language. Hence, an ethnographic film can only be made by an anthropologist or ethnologist (Urem 2015).

Figure 4. *Village Ritual Going on*

Source: Mitra et al. 2018.

In the following decades, ethnographic films and photographs became an integral part of anthropological research. Books and even many research articles published in recent times are full of photographs. All these films and photographs are produced either by the anthropologists themselves or under their direction. The photographed are the people, their lifestyle, their problems, their festivals, their sorrow, their happiness and almost everything under ethical boundaries. Robert J. Flaherty is regarded as the torchbearer of the series of ethnographic documentaries produced by others after his *Nanook of the North: A Story of Life and Love in the Actual Arctic Circle* (1922). This film was standout from its racial predecessors, like *Birth of a Nation* (1915) by D.W. Griffith, and was a contrast of "humanistic, poignant, dramatic, starkly beautiful and sympathetic look at an Inuit hunter struggle to survive in an inhospitable environment" (Kaurismaki 2009). An explorer by nature, Flaherty went on with many more documentaries like *The Pottery Maker (1925), Moana (1926), Industrial Britain (1931)* etc. (Essner et al. 1987). Apart from being ethnographically rich and explorative, Flaherty's movies are way free of ethnocentric bias and racial inclination. With colonial industrial expansion explorers' spreads across the world and encountered exotic cultures. Some of these encounters graduated into documentaries, for example, *Song of Ceylong* (1934). The film is based on the cultural and religious customs of Sinhalese of, now, Sri Lanka and the effects of advanced industrialization on such customs (Graham 1980). Mead and Bateson dived deep into the customs of

Balinese dance and explored the difference in cross-cultural perception. Their film *Trance and Dance in Bali (1951)* shows that the westerly believed peculiar events of trance can be normal and sacred in other beliefs (Weynard 2016). The most famous and commercially successful movie was the instalments of *Gods Must be Crazy* (henceforth GMC), 1980 and 1989, respectively, by Jamie Usy on the Bushman. Whether these movies are documentaries or not is much debated as Usy himself termed his ventures solely for entertainment purposes. Despite its commercial success, these movies pulled much anthropological critique which accused GMC franchisee of racial discourse and white political propagandism while covering the real essence of Bushman life (Tomaselli 2006). Regarding the "real essence" one documentary film in India by Robert Gardner is worth mentioning here. *Forest of Bliss (1986)* catches the "juxtaposition and interpenetration" of life and death as per Hindu ideology in Varanasi, India (Chopra 1989). In the 2015 movie, *The Anthropologist* by Seth Kramer, Daniel A. Miller and Jeremy Newberger pan through the life of an anthropologist mother and her daughter and their travel to places affected by climate change. The movie showcases human adaptability in changing scenarios in a contrasting and juxtaposing event of climate change and the change of relation between a grown-up daughter and her mother (Genzlinger 2016). In the following year, another anthropological movie was released, which is standout from others in its method of storytelling. *The Possibility of Spirits* (2016) by Mattijs Van De Port encountered the events of spirit possession in Brazil. Mattijs goes reflexively, saying, "I don't know what it is that I'm filming", teasing the fact that anthropologists can record the phenomena but cannot explain everything (Van de Port 2017). He leaves the scope for subjective understanding for the viewers by not trying to explain what is happening (Feldman et al. 2019, Van de Port 2017). Another movie, which follows the method of reflexive and non-explanation, was *The Slave Genesis* (2017) by Anneez K. Mapila. The movie is about the life, exploitation and slavery of the Paniya people of Kerala. Annees adorned the movie with a recollection of his life lived with Paniyas' and the movie goes on primarily through visuals and less narrative. About which Aneez said, "I wanted the audience to interpret the film primarily through these (visual), and not through dialogues"[1]. This movie won the National Film Award for Best Anthropological/Ethnographic Film in the year 2017, together with *Name/Place/Animal/Thing (2017)*[2]. The movie is about the unique naming tradition of the HakkiPikki community of Karnataka.

In the course of history, anthropological/ethnographic filmmaking gradually evolved from an explanatory exploration of the whole culture to issue a specific recording of phenomena while leaving scope for subjective interpretation. But, as anthropologists are always trying to include the "studied" as research participants,

[1]"I don't want people to see *The Slave Genesis* as an anthropological film": Aneez K Mapila. Interview of Aneez K Mapila by Sreelakshmi for Indian Cultural Forum. Published in Indian Cultural Forum Website on April 18, 2018. Accessed from https://archive.indianculturalforum.in/2018/04/18/the-slave-genesis-65-national-award-aneez-k-mappila/ on April 24, 2020, 13:55 IST.

[2]"Film on HakkiPikkitribals wins national award" by Nita Sathyendran published in The Hindu on April 18, 2018. Accessed from https://www.thehindu.com/entertainment/movies/nitin-r-on-his-national-award-winning-debut-film-nameplaceanimalthing/article23584385.ece on April 24, 2020, 14:07 IST.

there is a small glitch with the use of the visual method. That is, what we see in an ethnographic film and photographs is actually through the eyes of an ethnographer, who is behind the camera and controlling the lens. The observed is passive and only be active when the researcher allows so. This issue was addressed by Wang and Burris (1994) with their newly formulated technique, which was known as "photo novella" during its inception but later and now known as "Photovoice". The most important character of this technique is to enable the voice of the people. In this technique, it's the people who handle the camera in place of the researcher to explore their own community. This technique has three objectives, first, enabling people (understudy) to visually document the issues, aspects and concerns of their own community from their own eyes and on their terms; second, to generate critical discourse and perception among the community members through group discussions based on the documentation; and third, empowering people with a capacity of needs assessment and reach the policymakers (Wang and Burris 1994, Wang and Burris 1997, Latz et al. 2016). Photovoice became a frequently used technique in community-based participatory research and has been extensively used in complex public health problems (Nykiforuk et al. 2011), homelessness, education, feminist research etc. (Ewald 1985, Hubbard 1994, Sutton-Brown 2014, Latz et al. 2016). It is such a technique that is usable by the participants, unlike the other social research techniques. And its effectiveness is not limited to only research but also contributes to activating people in problem-solving.

The use of photovoice techniques in the field can be way less expensive than other techniques in visual studies. Though the creators and earlier users of this technique used disposable cameras which they hand over to participants to capture images, at present-day availability of mobile phone cameras makes using this technique a lot easier. Almost every person in cities and many people in village communities possess camera phones which can capture good quality images/ videos. Simultaneous development in the field of digital media can also be useful for the photovoice technique. For example, the very recently developed mobile cinematography. In this trend, amateur (mostly) photographers use smartphones for filming in different genres of cinema. Mobile cinematography is all about how a mobile (or smartphone) can be used as the primary camera in the art and process of movie-making. A visual ethnographer equipped with the knowledge of the principles of photovoice and mobile cinematography can engage community (understudy) persons who will narrate (by filming) a social issue in their way. Similarly, the ethnographer will audio-visually record the moments when the group discussion based on the recordings are ongoing, needs assessment is building up. Such ventures could yield amazing results in problem identification, showcasing issues from the perspective of people and reaching people of the outside world and policymakers.

Discussion

Gradually but steadily, visual has penetrated in almost every discipline. Though a late runner, anthropology has also adopted it and has produced a good number of ethnographic films dating back to the emergence of modern ethnography (Xiong and Li 2021). Visual anthropology has become a handy, helpful tool for defining both the possibilities and limitations of the film and writing for theorizing the experiences about the others (Pink 2006). Visual is popular culture now where people are not only passionate consumers of visual media but also avid producers. Cameras are no longer a grandee, and exclusive possession of riches and anthropologists, even after the advent of small point-n-shoot cameras and smartphones, visuals became a household medium to see the world and represent the self (Nuska 2019). Here situates the importance of taking visual measures in anthropological studies. Especially the newly evolved photovoice technique has the potentiality to get into the perspective of "co-researchers" (Woodgate et al. 2017) and going a step closer to the idea of a participatory approach. In photovoice, the people under study are "co-researchers" or co-authors of the research because they will reflect their ideas through symbolic images or video, which is free of bias of the anthropologist and can minimize the unforced error committed by anthropologist's etic self. Again, visual is a handy tool for the people to participate in research because reflexive writing or comprehensive speaking may not be a feasible job for a, for example, less educated shepherd, but he can surely make a video of how they assess the age of a sheep by using traditional knowledge. For example, the snapshot (Figure 5) is taken from a video made by a shepherd while another shepherd explains the traditional knowledge of estimating the age of a sheep by counting the number of teeth it has. No textual description of it can even stand a chance before this direct visual description by the practising community.

Figure 5. *Estimating the Age of Sheep by Counting Teeth*

Source: Mitra et al. 2019.

Conclusion

Ruth Benedict once said, "The purpose of anthropology is to make the world safe for human differences" (Haviland 2005). It clearly denotes that anthropological ventures and findings should have a greater reach, beyond the academicians, to the general public. Now, reaching the general public of various education levels, diverse economic backgrounds, and age groups with specialized research findings is not easy. The language and style of narration used in research articles and books cannot evoke interest among them. It is the same way in which a social researcher may not find any interest in reading a research article on quantum physics. This gap of interest can be bridged by using infographic presentation. For example, an ethnographic account presented in the form of a coffee table book, which is largely pictorial with less but adequate description in simple language, or informative TV shows with anthropological inputs often aired in channels like BBC World and National Geographic. All these visual presentations are made by keeping in mind the habit of consumption of visual data of the people. To be a people's discipline, anthropology needs to dive deep into the fast-changing consumption behaviour while seeking active participation from peoples end and finally dissemination of findings in accordance to people's consumption behaviour.

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